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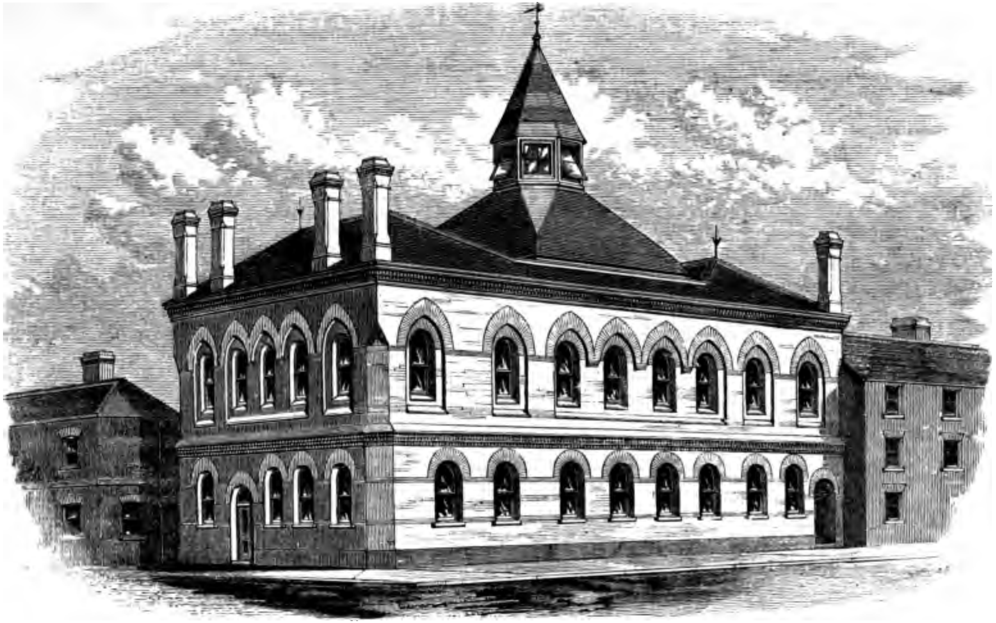

UNIVERSITY GYMNASIUM, OXFORD.

Clarendon Press Series

PHYSICAL EDUCATION

BY

ARCHIBALD MACLAREN

NEW EDITION, RE-EDITED AND ENLARGED

BY

WALLACE MACLAREN, M.A., PH.D.
OF THE OXFORD UNIVERSITY GYMNASIUM

WITH FOUR HUNDRED ILLUSTRATIONS DRAWN FROM LIFE

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PREFACE

TO THE NEW AND ENLARGED EDITION.

It is now more than thirty years since the demand for systematized Physical Education began to make itself heard in this country; but the sense of its importance, radiating from the centres of Oxford and Aldershot, has since spread throughout civil and military England, till to-day there is scarcely a town or a depôt which does not possess its properly equipped gymnasium. The arrival of the first detachment of non-commissioned officers who, under Major (now General) Hammersley, went through a half year's course at the Oxford University Gymnasium in 1861, proved the beginning of a system which, under that officer and subsequent inspectors of military gymnasia, has been the means not merely of materially benefiting the physique of the army, but of giving an impetus to physical education generally, for which as a nation we cannot be sufficiently grateful.

Fortunately it is unnecessary, writing at this date, to dwell on the value of gymnastics to all classes of society, and on the necessity of devoting a certain part of the day to the development of the body as well as of the mind. Their value, and the appreciation of their value by the public generally, is sufficiently testified to by the fine gymnasia of the military colleges, of Harrow, Wellington, Winchester, and almost all the large educational establishments of the country, by the extensively patronized buildings of the different gymnastic societies in London, in Liverpool, Leeds, Aberdeen, and a hundred other busy centres; and even more so by the growth of such bodies as the National Physical Recreation Society or the Royal College of Gymnastics, whose sole object is the spread of Physical Education. The value, the necessity of gymnastics is established, and there is no need now, as at the time when the Oxford movement was initiated, to force their importance upon the world or to combat old-fashioned prejudices which have long since given way.

The time seems indeed to have come when gymnastics proper may play a still more important part in the Education of all classes, the term gymnastics proper implying that form of gymnastics which, whether on apparatus or not, has a definite object in view and is not purely recreative. In dealing practically with such a question, a broad distinction must at once be drawn. On the one side we have to deal with the upper and middle classes, in fact with all that large class who are sent to private and public schools or training colleges for their education, and proceed to the army, to the Universities, or to business life. On the other side is the still larger class of those whom the nation educates, a class which the subject of gymnastics may be thought to touch more nearly, inasmuch as, after an early age, they have little or no time for recreation like those socially above them, and the gymnasium is therefore to them a vital source of health.

The requirements of these two classes physically are in themselves distinct and must be dealt with from an altogether different standpoint. It has been felt, no doubt, that the lads of our schools and colleges are under the care of capable earnest-minded men, who are in a sense responsible for their physical improvement as well as their mental; and hence it is that less attention has been called to this side of the question; whereas the other section of the community has been dependent for its gymnastic recreation on outside help, and its progress has been almost entirely due to the disinterested work of a few enthusiastic men. But however late we be in initiating as a country a *national* system of physical education, one is encouraged by the progress of recent years to the belief that such a system may now be not far distant.

The glaring fault in the old days was that gymnastics were left (such as they were) to grown-up men; there was not a single college, for instance, civil or military, which boasted such a thing as a gymnasium, and Mr. Archibald Maclaren had to labour to show, what to-day is recognized, that it is while the body is *growing* that gymnastics exercise their greatest benefits, and that the time for mental and bodily education is one and the same.

Foolish objections may even now be heard, though much more rarely, and then, it may safely be said, always on the part of some one who is ignorant of the subject. Not long ago the superintendent of a large school gymnasium said to me 'X . . . (the "football master") has had to give way; my six gymnasts are the best men in the team"—but to the hard work in converting Mr. X. I can testify. Similarly, but a short while back, a member of a recent Oxford University cricket XI, and no mean football player, said to me as I was officiating at a school competition, 'he was sure that gymnastics made boys slow of movement in their games, though he had done little in the gymnastic line himself'—and not many minutes afterwards was complaining that, though his legs were of a tremendous size, his arms were quite small. I suppressed my smile. I merely however give these as instances of the difficulties and prejudices which had, and in some cases still have, to be encountered. But one would judge that the authorities of public schools and like institutions realize themselves to-day that they are responsible for the physical as well as the intellectual growth of those under their care; otherwise there would scarcely have taken place the rapid growth of fine buildings for use as gymnasia, which, as above alluded to, has been noticeable of late years. The only wonder is that they were delayed so long, for undoubtedly the parent has a right to demand that, as the growing time for mind and body is the same, both shall receive equal attention from his son's temporary guardians. The responsibility is, as we say, acknowledged, and in almost all the large institutions the means to the end are there; the question which arises is 'Might not even better results be obtained?'

The answer to this question is not far to seek. It is in the public schools and training colleges, if anywhere, that the old distinction of educational and recreative exercise must be enforced. No one, with the subject at heart, would do away with the present importance ascribed to games. Unlike some, I would not lessen these by one iota; if something must give way, least of all let it be cricket and football; their value even of recent years has probably never been set too highly. But however invaluable, however health-giving, they remain recreative exercises, and as such cannot suit all members of society, delicate and strong, equally. The place of the gymnasium in a school is to *correct* the school games and to complete the part which they leave unfinished, and also, in the case of weaker subjects, to supply their place to a certain degree. In this lies the most important sphere of the usefulness of gymnastics, their application to the weaker members, to those who are physically unable to undertake the strain of the severer games. How many are there in our schools and in our towns who are forbidden by the doctors to play football or take part in a paper chase, for some sound medical reason? To them the gymnasium is at once the best recreation and the best education; it is for such, and for those who can spare but a brief hour (more often than not an evening one) that the 'System of Physical Education' was primarily intended, equally as much as for those who are more fortunate in having health and leisure at their command.

To-day, in the altered state of things, with gymnastics occupying a totally different status from that of five-and-twenty years ago, when the 'System of Physical Education' was first published; with the growth of their popularity amongst all classes, and specially amongst those in the large cities, who can only devote an evening hour to their enjoyment, (and, finally, with their systematized adoption throughout the army), the question of the old days has undergone a great change. It is now no longer a question of popularizing gymnastics, but of keeping them within bounds, of separating the spurious from the genuine, of making clear the distinction between beneficial exercises and acrobatism.

The present is an age of competitions, and it is important that a word should be said here on the subject of gymnastic competitions. Let them be encouraged by all means—school competitions, inter-school competitions, club competitions. All legitimate means should be taken to make gymnastics popular, provided that they are not treated merely as a sport; in that case, owing to the absence of excitement, they must of necessity fail by the side of our English games. But the danger of competitions lies in the desire to accomplish feats, and the tendency at present is undoubtedly to set exercises which are perhaps in themselves too arduous, or necessitate too long a practice on any particular machine, such as the parallel bars, which those of us, who are qualified to speak, know to be highly injurious when overdone.

It is noteworthy that during the long interval of twenty-five years, since the 'System of Physical Education' was first published, no other apparatus has been invented, or, if invented, been sufficiently abiding, to be worthy of a place in the gymnasium. Modifications of the old apparatus, such as the vaulting-horse and parallel bars, there have been in abundance; but it is to be doubted whether pommels, sloping bars, and suchlike variations are of any value except for the performance of tricks. Modern ingenuity seems rather to have busied itself with what may be termed Home gymnastics—that is, apparatus with pulleys attached to a weight, enabling one to work the arms or legs in any direction, and practically to call on any muscles or set of muscles at pleasure. By far the best of these different kinds of apparatus are manufactured by the Naragansett Company, of Rhode Island, U.S.A., which enterprising firm may be said without exaggeration to have a machine for every muscle in the body. And let it not be thought that such apparatus is without its usefulness. For those who have no gymnasium to attend, or no time to afford for attendance, such home gymnastics are invaluable; whilst even for those who have such opportunities a little before-breakfast work of this kind is most health-giving. But to imagine that they take the place of progressive work in the gymnasium would be as sheer nonsense as to claim that swinging a pulley-rope and executing a nice exercise on the horizontal bar, possess the same amount of interest for the performer! The rage nowadays is to have a machine for everything, but it is open to question whether these machines can supply the place of the good old-fashioned dumb-bell or pair of clubs, previous to the cold tub in the morning.

Noticeable also amongst modern innovations is the Musical Dumb-bell drill and the increased popularity of the Swedish movements without apparatus. The musical drill is a valuable addition to the gymnasium, and deserves a cordial welcome, giving life and vigour to the exercise and being specially effective in the case of gymnastic displays. It implies of necessity the use of very light dumb-bells, for which of late years there may almost be said to have been a craze; and though these cannot supply the place of the older methods of progressive dumb-bell exercise, they form a pleasant change and supply healthy recreation. Several manuals of these exercises, set to popular tunes, have already been published, and as they merely supply in a recreative form the place of the more serious graduated dumb-bells, it has not been thought necessary to include them in the present work. The Swedish movements without apparatus, to which we have also alluded, are merely valuable for beginners and as preliminaries to the exercises with apparatus that are fully described in the System. That free exercises are in themselves adequate, or capable of developing the whole bodily powers is erroneous and opposed to the whole theory of progressive gymnastic exercises.

The present edition of the book will be found to differ from the former ones almost solely in the greater variety of the exercises described. So far as the theoretical part is concerned, it has scarcely been found necessary to make a single alteration. In one or two cases only, where the state of contemporary gymnastics was discussed, a few lines have been omitted, having lost their interest at the present day. On the other hand, in the practical division of the book, the progress made within recent years in this particular branch of exercise, and the tendency of modern feeling, which requires a higher standard of excellence than formerly, have necessitated considerable addition and rearrangement. This will be found to be more particularly the case with the Vaulting Horse, the Parallel Bars, the Pair of Rings, and the Horizontal Bar, for it is with exercises on these machines that the greatest progress has been made. To these alone upwards of a hundred exercises, and nearly as many new illustrations, have been added. In far the greater number of cases these additions concern advanced and arduous exercises. With the elementary exercises scarcely any addition has been found necessary, so amply were they set forth in the earlier editions; and they are still presented with as great, or even greater, care than the more attractive ones. In the modern gymnasium there is a lamentable tendency to sacrifice the Beam, the different varieties of Plank, the Elastic and Bridge Ladders, and similar machines, for the more showy Parallel Bars and Horizontal Bar. The great detriment which this implies to those who are physically still unformed, can only be thoroughly understood by those who are conversant with the subject. In the System the exercises on the former machines play an even more important part than the latter, forming the foundation on which the structure of perfect development is reared; they are dealt with in great detail, and it is perhaps for this reason that, notwithstanding the progress and alterations of recent years, the book still abides, both in America and in this country, as the text-book of gymnastics proper.

Another speciality of the book is the care which has been taken to mark with due importance the position and 'form' in which every exercise should be accomplished. We owe to the Aldershot school, more than anything else, the preservation of that accurate style which gives a polish to all gymnastic exercises; and it is not too much to hope that their precise methods, as laid down in these pages, may become the standard ones of all English gymnasia. The greatest care has been taken throughout the book in discriminating between skilful exercises and mere tricks, and no exercise has been introduced into the System which does not admit of being performed in perfect safety in the company of a skilful conductor. The greater number of the new exercises come in the fourth course—arduous exercises to be attempted only when the pupil is a sound gymnast; in cases where exercises, though safe for the experienced, are only valuable for the variety which they afford, they have been placed in an Appendix at the end of the several machines; risky exercises are in some of the best-known cases merely scheduled; otherwise they are excluded from the book. At the same time, it must be remembered that, throughout the learning of all exercises, it is pre-supposed that a qualified instructor is on the spot, who can judge of the capabilities of his pupils.

With the introduction of trickeries and fancy-work into modern gymnastics there has grown up a tendency, a very regrettable one, of coining new names for every fresh combination of exercises—names often unsuitable and in numerous instances either exaggerated or grotesque. I allude to such terms as 'lion-crawls,' 'dislocations,' 'wolf-jumps'—words which presumably owe their origin to the debasing of gymnastics to the level of acrobatism. It is astonishing that any should try thus to confuse a subject in which but a few technicalities are really necessary, when all who have the subject truly at heart would rejoice to make the province of pure gymnastics more secure than ever against the inroads of professionalism. The names of exercises have in this case only been given in the text where they are universally known, or where they bear directly upon the exercise described.

In the original edition of the book, one of the chief merits was that, in order to make it a complete manual of progressive gymnastics, every illustration was taken from life, each one being in fact drawn from the actual performance of a very capable gymnast. In this enlargement of the work the same principle has been adhered to, and each additional illustration is the result of a sketch or an instantaneous photograph taken from the performance of a well-known late Aldershot instructor; and my best thanks are due to Mr. Macdonald for his share in what I think must be considered most satisfactory results. New tables have been added to the Appendix showing the growth and development of those taking regular systematized gymnastic exercise, and it is hoped that, in its present enlarged and more modern form, the book may continue to be the Text-Book of the gymnastic profession.

WALLACE MACLAREN.

OXFORD UNIVERSITY GYMNASIUM:
January 1895.

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INTRODUCTION.

GROWTH AND DEVELOPMENT.

THE frame of every individual has its ultimate size, shape, and capacity determined from the commencement of its organization—bears within itself the germ of its perfectibility; but to this it will only attain when the laws and agents which regulate and support its growth and development are faithfully observed and duly administered.

In the sense in which these two processes will be spoken of in the succeeding pages, the former is regarded as a mere increase in height, usually completed about the eighteenth or nineteenth year; and the latter as the bringing to their proper size, perfect conformation, and highest capacity, the several parts which together make up the body as a whole, seldom completed before the twenty-third or twenty-fourth year[1].

The first part of the process of development has already been accomplished at birth, each organ and limb having its destined relative size, shape, position, and function assigned; but the second part, the bringing of each of these to its completion, remains to be accomplished. This ultimate development is however an essentially different operation from the first; the one being the unfolding, as it were, of the several structures from an original germ by laws of which we have at present no definite knowledge, while the latter consists in the adding to and consolidation of these by agents with which we are comparatively familiar, and by laws with which we are daily becoming better acquainted. It is this second or ultimate stage which forms the subject of the present work.

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[1] See *Appendices* A and B.

Exercise alone of all the agents of growth and development can be regarded in an *educational* light—alone is capable of being permanently systematized and administered as a means of progressive bodily culture. There are rules and regulations to be observed in the administration of the other agents, to suit age and season, and habits and occupations; and on the judicious observance of these much of the bodily health of all, but especially of the very young, the middle-aged, and the old, depends; but it is to Exercise almost exclusively that we must look as the means of actual physical culture during the greater part of the period of growth and development. In a treatise on Physical Education therefore, Exercise claims the most important place—claims it however not more from its own value than because it is so much more liable to be misunderstood, misapplied, or neglected than any of the others. Air, food, and clothing are all, in a measure, familiar to every one; and although with many the *modus operandi* of each may not be understood, still their results are evident and immediate; and where error in their application is committed, it is usually either from some inevitable cause of hindrance, or from wilful infringement of laws of which ignorance cannot be pleaded. Thus the dweller in the crowded city is quite aware that it would be better for him and for his children to breathe

the pure air of the country; but his avocations determine for him the place of his dwelling. The insufficiently-fed knows well that it would be better for him and for those for whom he has to provide to have abundance of nourishing food; but his poverty determines for him his diet. On the other hand, the intemperate needs no other reminder than the bodily discomforts he experiences to know that by him one of the agents of health has been abused, and its laws broken: he was conscious of the fault on its committal—the penalty also was foreseen. But this is not the case with Exercise; in its nature and in its influence it is still greatly misunderstood, and although the evils which arise from its abuse or misapplication are really as direct and as serious as those which follow the non-observance or misapprehension of any other agent of health, their origin is often less apparent, and they follow less suddenly on the committal of the fault: the punishment is as sure and as severe, but not always as clearly traceable to the transgression. Error here in a great majority of cases may arise from actual want of knowledge. It is comprehended at once that all the other agents may and should be modified to meet the wants, and to suit the age, the health, and the habits of individuals, but not so with Exercise. Persons of the most opposite bodily condition and capacity will without question or consideration undertake the same physical exertion, although to one the effort may be slight, to the other exhaustion unavoidable. A vague feeling may be entertained that Exercise is a thing to be taken, but to what extent, at what time, or in what manner, are points upon which few really consider it necessary to possess any adequate information. The regular urgent reminders which follow on the neglect of the other agents are missing here; or when they do occur it is only as they affect some other one of these. For want of Exercise, appetite fails—for want of Exercise, comfortable bodily warmth is not sustained—for want of Exercise, refreshing sleep is not obtained—but these, reminders though they be, come indirectly and, as it were, incidentally only. They speak not with the imperative voice of hunger or thirst, or cold, or oppressive heat, or fatigue, or unpleasantly affected respiration. Unfortunately also there are many persons who have what might almost be called a natural disinclination to bodily exertion, that is, a disinclination to physical effort, inherited or induced by circumstances attending the comforts, the luxuries, and the occupations of civilized life—a disinclination which, unless combated at the very outset, grows stronger by indulgence; for Exercise is determined by what a man *does*, not by what he possesses or can obtain. It is from these and many other reasons hereafter to be noticed, such as extreme mental employment and the engrossing cares and absorbing anxieties of business, that Exercise in the present day holds its all-important place among the agents of health, and the laws, which regulate its administration, their all-important office in promoting growth and development.

What then, as I have already asked, and do not now for the first time endeavour to answer[1], is Exercise? What does it do? and, How does it do it?

Exercise may be defined as muscular movement produced by muscular contraction, by which indeed every motion of the living organism is accomplished. This property of contractility with which muscular fibre is endowed, and which, as far as we know, is shared by no other constituent of the body, is to some extent described in the term—being the power of contracting or shortening the space between its two extremities.

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[1] See 'Training.'—Macmillan, 1867.

The entire muscular system has been primarily divided into *voluntary* and *involuntary* muscles. The first, comprising all those which are subject to the will, form the bulk of the muscular system; they are mainly distributed over the framework of the bones, their office being to move the part or parts to which they are attached. The second comprises those over which the will has little or no control, but which are stimulated to action by some other agency, each muscle or class of muscles having its proper stimulus; these are placed chiefly within the cavities of the body, and are employed in the vital processes of respiration, digestion, circulation, &c. It is with the voluntary muscles that we have now particularly to deal.

Exercise I have defined as muscular movement; but it must be movement of force sufficient to engage the energetic contraction of the muscles employed. Here we are touching upon the most important principle in the entire subject under consideration, namely, the destruction and renovation of the tissues of the body which it is the object of Exercise to accomplish.

Our material frame is composed of innumerable atoms, and each separate and individual atom has its birth, life, and death, and then its removal from the 'place of the living.' Thus there is going on a continuous process of decay and death among the individual atoms which make up each tissue. Each atom preserves its vitality for a limited space only, is then separated from the tissue of which it has formed a part, and is resolved into its inorganic elements, to be in due course eliminated from the body by the organs of excretion. These processes are greatly influenced by the activity of the bodily functions. Every operation of the muscles or nerves involves the disintegration and death of a certain part of their substance. We cannot lift a finger, we cannot perform the slightest movement, without causing a change in certain of the atoms which compose the muscles executing the movement, in those of the nerves conveying the stimulus which directed them to contract, and in those composing the nerve centres in which the stimulus originates; and this change involves their decay and death.

The loss then of the body, and of each part of the body, being in relation to its activity, a second process is necessary to replace the loss, otherwise it would rapidly diminish in size and strength, and life itself would shortly cease. This reparative process is performed by the nutritive system, the organs of which convert our food into blood—liquid flesh (*chair coulante*), as it has been called—which in itself contains, and in its never-ending circulation bears to each tissue, the material for the replacement of all waste and for the building up of all additions. And as this material is borne along through channels permeating every part of the organism, each part, by a law incomprehensible but unerring, selects from it and appropriates that particular *pabulum* which is fit for its special use, and that only. At every point of the human body is this law in unceasing operation—activity, a loss of vital power, disintegration, decay and removal—to be met by a replacement of substance and a renewal of vital power. And as the disintegration of any part is hastened by its activity, so by an equally unerring law is the flow of blood, bearing the renewing material, increased in that part; and again by a law equally unerring and ever operative, the worn-out particles are cast into this current in its backward course, and conveyed to organs whose function it is to eliminate them from the body. And during the period of growth, and, within certain limits, until the full attainable physical capacity of the individual has been reached, the new will ever exceed the old, so that a gradual increase in bulk and power will be obtained. And the strength of the body as a whole, and of each part of the body individually, is in relation to the frequency with which these atoms are changed; and the strength of the body as a whole, and of each part of the body individually, is thus ever in relation to its *newness.*

Exercise, then, as we have seen, is the chief agent in the destruction of the tissues; but it is also the chief agent in their renovation, inasmuch as it quickens the circulation of the blood from which the whole body derives its nourishment, the tide on which is brought up all fresh material, and on which is borne away all that is effete and useless—brought up and borne away most rapidly in those parts which are being most rapidly employed, where disintegration is most rapidly taking place.

I am here purposely narrowing my subject, and limiting my observations to the process of circulation only as it affects the nutrition of the muscles; but all the systems of the body, and every process connected with its growth and development, or influencing its health and strength, are also proportionately affected by the acceleration of the circulation of the blood by exercise.

But besides muscular movement, true Exercise possesses another ingredient, which may be termed *resistance.* The voluntary muscles are made to do more than merely to move the *parts to* which they are attached.

Man is placed on the earth to labour, to toil, to overcome and to remove material obstacles innumerable. Everything which floats upon the ocean or is built upon the land is the work of his hands—in simple fact, has been constructed by the contractions of his voluntary muscles; these muscles were made therefore not merely to enable him to *move*, but to do this and to carry his burden too. They were made in their action to encounter and overcome *resistance* in every movement; and being created for this, their health and strength will be developed and sustained in proportion to the fidelity with which this their design is remembered and observed. Exercise, which is voluntary labour, must resemble actual labour in all its physical essentials, if it be desired to obtain from it the physical advantages which actual labour bestows; without resistance there can be no full demand for muscular contraction, no full call therefore for material disintegration, no full requirement therefore for material renewal involving proportionate increase of bulk and power; for, as we have seen, the strength of the body, and of each part of the body, is in relation to its youth or newness.

These are the chief essentials of Exercise when viewed in connexion with the voluntary muscles; but it is also an essential of true Exercise that the movements of these muscles shall be of speed or force sufficient to quicken the breathing; in other words, to increase the action of the *in*voluntary muscles engaged in the processes of respiration and circulation. During active exercise the act of breathing becomes greatly accelerated; each inspiration is larger in volume, and each follows each in quicker succession, than when the body is inactive. This is a most important feature of exercise, for with every breath a load of the wasted material of the body is given up by the blood in the form of carbonic acid, &c., and its place supplied by life-giving oxygen from the surrounding atmosphere. To make this all-important process plainer, let us glance at the mechanical action of breathing.

On the requirement for air, the *besoin de respirer*, being experienced, the inspiratory muscles contract and lift the osseous framework of the chest, thus increasing its diameter from side to side and from back to front; while at the same time the large arched muscle (the diaphragm), forming the convex floor of the cavity, also contracts, and in doing so its fibres are straightened, and its elevated surface is consequently depressed, increasing the diameter of the chest from above downwards. As this takes place the air rushes down the trachea, or windpipe, and passes at once into the lungs, which it fills out in every direction. But all muscular action is intermittent; the contractile effort accomplished, the reaction begins; the inspiratory muscles relax and a second set of muscles, the expiratory, antagonizing those which lifted the walls of the cavity, now contract, and the muscles of the abdomen, antagonizing the diaphragm, also contract, and the air is expelled by the aperture through which it entered. This is, in outline, the process of ordinary effortless breathing; but in the forced respiration of energetic exercise, and especially of exercise calling into action the muscles of the upper limbs and the upper region of the trunk, many of the voluntary muscles may also be employed in the process of respiration.

I have stated that the involuntary muscles are prompted to action each by its proper stimulus; and the heart is stimulated by the presence and augmentation of blood within its cavities. Thus, the instant that any act of exercise begins, a considerable number of voluntary muscles are put into rapid employment; the contractile action of these muscles impels the blood in their veins onwards towards the heart, venous blood being greatly dependent on muscular action for its circulation; and the heart, stimulated by its presence, energetically contracts, ejecting its contents, and the blood is flushed along the pulmonary artery and distributed throughout its ramifications in the lungs. As the exercise continues, wave on wave comes up from the heart, each driving before it its predecessor—out of the lungs, along the pulmonary veins, back to the heart, where it is again rapidly admitted and as rapidly ejected[1]: for the heart is a double organ, performing the double office of propelling the blood through two distinct channels of circulation—through the one for its aëration in the lungs, through the other, when so aërated, for the nourishment of the whole body. Out of the heart then it is again ejected, out by the great trunk arteries, and along their innumerable branches, to complete the round of the systemic circulation. But neither heart nor lungs, nor vein nor artery, throughout the double circulation, is a *passive* agent in its progress; for though the heart is the great agent of propulsion, the whole circulatory channels possess a certain amount of contractile power, and are endowed with a degree of elasticity, and may in fact, in this respect, be regarded as hollow muscles actively engaged in regulating the moving current within them; and their health and strength, and functional ability, are promoted by the same agencies, as they are subject to the same laws, as those which influence the condition of the rest of the body.

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[1] The quantity of blood ejected from the heart of a healthy adult of middle stature, at each propulsion, is estimated at about two ounces.

On these two powers, muscular and respiratory, depends the ability to perform all bodily exercise. The first involves the contractile force of the voluntary muscles employed; the second is more complicated, involving the contractile force of the heart, the condition of the lungs to perform their function, the size and shape of the chamber in which these organs are contained, and the contractile force of the respiratory muscles, voluntary and involuntary.

Such in brief is Exercise, such the ends which it accomplishes, and such the manner of their accomplishment; namely, the *destruction* of the tissues, the hastening of the decay and death of every part coming within its influence; but also the speedy removal of all waste and the hastening forward of fresh material for its replacement; and in doing this it attains three distinct but co-relative results.

1. It increases the size and power of the voluntary muscles employed.
2. It increases the functional capacity of the involuntary muscles employed.
3. It promotes the health and strength of the whole body by quickening circulation and increasing respiration.

Our first record of physical training, that is to say, of any system adopted and practised with the single view of improving and cultivating the physical resources, is to be found in the competitive exercises of the early Greeks and Romans; and it has been said that we have lost as much by the discontinuance of the system of bodily exercise of these nations as we have gained by our knowledge of physiological science. This is one of the aphorisms which men are fond of repeating, but which will not *stand criticism*. No price can be set upon our knowledge of physiological science, no estimate can be formed of its value. The extent, the importance, and the value of the system of bodily exercise practised by the Greeks and Romans we can appraise exactly—can gauge with almost mathematical accuracy, because we know entirely of what it consisted and for what purpose it was organized and maintained. We can therefore tell, by a comparison of the want experienced with the thing produced to meet the want, if the object desired were accomplished; and we can do this chiefly, if not wholly, by the light of physiological science, which alone has revealed to us what Exercise is, and what its suitable administration can accomplish in the human frame.

It is generally admitted that this system of bodily training—unguided, undirected as it was by a ray of science deserving of the name—accomplished the object desired. How did they who framed it, thus groping in the dark, grapple with and hold fast by the truth? By the observation of results. This was the lamp which guided them in the selection of the exercises which formed their system of bodily training. They observed that the strength of the body, or of any part of the body, was in relation to its muscular development, and that this development followed upon, and was in relation to, its activity or employment. They did not know that man's material frame was composed of innumerable atoms, and that each separate and individual atom had its birth, life, and death; and that the strength of the body as a whole, and of each part individually, was in relation to the youth or newness of its atoms. And they did not know that this strength was consequently attained by, and was retained in relation to, the frequency with which these atoms were changed, by shortening their life, by hastening their removal and their replacement by others; and that whenever this was done by natural activity, by suitable employment, there was ever an advance in size and power, until the ultimate attainable point of development was reached. They simply observed that the increased bulk, strength, and energy of the organ or limb was in relation to the amount of its employment, and they gave it employment accordingly.

They must have observed, however, that this did not apply in equal degree to all kinds of muscular employment, and that it applied most directly to those where the action was rapid and sustained. They did not know that this rapidity of muscular contraction and expansion was the chief agent in quickening the circulation of the blood, from which the whole body derived its nourishment; the tide on which was brought up all fresh material for incorporation into its tissues, and on which was borne away all that was effete and waste—brought up and borne away most rapidly in those parts which were being most rapidly employed—for they did not know that the blood was a moving current at all. They only observed that exercises consisting of rapid muscular movement were most conducive to strength and activity; so, without exception, the exercises composing their system were of this description.

But they must have observed also, that there was a form of physical employment which did not give physical development, or yield its natural fruits of health and strength; and that was the slight, effortless occupations of many art-callings and crafts. They did not know that without *resistance* to be overcome there could be no full demand for volition, no full call therefore for material disintegration and renewal, with proportionate increase in bulk and power. They simply observed that development was in relation to the quality as well as to the quantity of exercise—that where energy was exacted in the practice, energy was the fruit of the practice; so for their system they selected exercises where energy was voluntarily called forth in the highest possible degree.

Other essential constituents of exercise owed their recognition to the same source—the observation of results. They observed that during certain kinds of physical exertion the act of breathing became greatly affected, that each inspiration was larger in volume, and that each followed each in quicker succession, than when the body was inactive. This they must have observed, although they may have viewed it but as a drawback to physical ability, a hindrance to be overcome, or in the same light in which our schoolboys now view it—as a condition of 'bad wind' or 'internal fat;' for they could not know that in every breath they breathed, a load of the wasted material of the body was given up by the blood and its place supplied by the life-giving oxygen from the surrounding atmosphere; and that just in proportion to the rapidity and energy of muscular movement during the exercise was the rapidity and volume of the current of the blood rushing through the lungs; and that, therefore, for this current of blood to be aërated, proportionately large and proportionately rapid was the current of the air respired; and that, following the natural law of development being in relation to employment, the lungs themselves were strengthened by this increased activity. They, probably, simply observed that the power to sustain this accelerated process of respiration was obtained in proportion as the exercises which excited it were practised; so exercises which required the sustaining of accelerated breathing received an important position in their system.

They must have observed, further, that energetic physical exertion and quickened respiration caused the skin to be suffused with moisture, and that this gave instant relief from a discomforting sense of heat. They did not know that this augmented heat was in a great measure caused by the accelerated breathing—the fanning of the fire which is ever burning in the living frame; and they did not know that this moisture was water drawn from the blood and poured out over the skin's surface, in order that the discomforting heat might be with it eliminated. They did not know that the skin itself was a covering of marvellously woven network, presenting millions of interstices and apertures, and that each of these apertures was the open débouche or outlet of a duct or tube which, striking deep its convoluted roots among the underlying strata of blood-vessels, separated from the accelerated currents what might prove injurious to the health of the body, and poured it forth through these myriad mouths; but they observed that these skin-exudations proved a powerful aid to the acquisition of permanent health and strength, and notably so to the health, elasticity, purity, and beauty of the skin itself. So, without exception, every exercise in their system is of that kind which readily contributes to this result.

Finally, they must have observed, that just in proportion to the amount of clothing worn during exercise, were the processes of respiration, and the evaporation of this moisture from the skin, retarded. They did not know the structure or functions of either lungs or skin; still they saw that they both acted together, were stimulated to activity by the same means, and by the same means were sustained in functional ability; and that during physical exertion hindrance to both was in proportion to the amount and weight of the garments worn; so they simply, while performing their exercises, reduced their clothing to the minimum, and thence called their system of bodily training 'Gymnastics.'

Thus, then, by the observation of results were the ancients guided with sufficient accuracy in the comprehension of the chief features, and in the estimation of the relative value, of certain modes of bodily exercise; and thus they were enabled to choose, on assured grounds, those exercises which were most suitable for the system which they desired to organize. They desired a system specially applicable to individual culture, individual exertion, individual excellence, individual distinction; a system which should cultivate personal courage, presence of mind, and decision; a system possessing the utmost limit for individual effort, presenting the fullest opportunities for personal display and personal distinction. Therefore was the hand laid upon all exercises of high competitive effort—wrestling, boxing, throwing the discus, racing on foot, on horseback, and in chariot. The system was as simple, as practical, and as serviceable as the Greek shield or the Roman sword.

The system of bodily training of Greece and Rome had then but one aspect, one aim, one object. It was designed to practise the youths of the country in all exercises tending to qualify them for the exigencies of war, as war was then pursued, as campaigns were then made, as weapons were then borne, as battles were then fought. Other object, other aim, other aspect, had it none.

But in those days, as in our own, there must have been men of unsound constitution and imperfect growth, from original weakness of organization, or from illness, ignorance, neglect, accident, and other causes. What system of bodily training was framed for their behoof? None. Here the observation of results was unequal to the requirement. They could reach no higher—they aimed no higher—than the production of a series of athletic games, suitable to the young, the brave, the active, the strong, the swift, and the nobly born.

Our knowledge of physiological science is something more valuable than this. A system of bodily exercise which should give added strength to the strong, increased dexterity to the active, speed to the already fleet of foot, is not what is alone wanted now. It is not to give the benefit of our thoughts and observations and the fruit of our accumulating information to the already highly favoured, and to them only, that we aim. On the contrary, it is the crowning evidence of the Divine origin of all true knowledge, that in benefiting all within its influence, it benefits most bountifully those whose needs are the greatest.

In our days, as of old, the race is still to the swift and the battle is still to the strong, but the battle of life now is waged with the brain for weapon, and the race is the high pressure competitive efforts of memory and mind. These are the great and all-absorbing struggles of our times, a 'struggle for life' as hard, and involving results and transformations as unerring and inevitable, as ever were traced in the origin of species.

It is health however, rather than strength, that is wanted now—*that* is the great requirement of modern times, with modern men, at non-military occupations. Bodily power, activity, and stamina for the endurance of protracted fatigue, are still at this day as much the real want of the soldier as they were in the days of Xenophon, of Caesar, of Napoleon. But the purposes and practices of war are not the all in all with us as they were with the Greeks and Romans; nor are the whole of our able-bodied men under arms, nor the whole of our youths preparing for conscriptive battalions, as were the youths of Germany and France in the last century. Our own army, scattered over the whole globe, and encountering the severities of every clime, claims but a fraction of our men; a small portion only of our youths are in uniform; but other occupations, other habits, other demands upon mind and body, advance claims as urgent as ever were pressed upon the soldier in ancient or modern times. From the nursery to the school, from the school to the college or to the world beyond, the brain and nerve strain goes on—continuous, augmenting, intensifying. Scholarships, competitive examinations, speculations, promotions, excitements, stimulations, long hours of work, late hours of rest, jaded frames, weary brains, jarring nerves—all intensified and intensifying—seek in modern times for the antidote to be found alone in physical action. These are the exigencies of the campaign of life for the great bulk of our youths, to be encountered in the schoolroom, in the study, in the court of law, in the hospital, and in the day and night visitations to court and alley and lane; and the hardships encountered in these fields of warfare hit as hard and as suddenly, sap as insidiously, destroy as mercilessly, as the night-march, the scanty ration, the toil, the struggle, or the weapon of a warlike enemy.

Yes, it is *health* rather than *strength* that is the great requirement of modern men at modern occupations; it is not the power to travel great distances, carry great burdens, lift great weights, or overcome great material obstructions; it is simply that condition of body, and that amount of vital capacity, which shall enable each man in his place to pursue his calling, and work on in his working life, with the greatest amount of comfort to himself and usefulness to his fellow-men. How many men, earnest, eager, uncomplaining, are pursuing their avocations with the imminency of a certain break-down ever before them—or with pain and weariness, languor and depression; when fair health and full power might have been secured, and the labour that is of love, now performed incompletely and in pain, might have been performed with completeness and in comfort.

Let it not from this be inferred that I consider health and strength as in any manner opposed to each other; on the contrary, they are most intimately allied, and are usually by the same means and in the same manner obtained. Very closely are they connected, but they are not the same, and a man may possess either without the other. For strength may be due to the great force possessed by one system of the body, such as the muscular; or great force in one part of the body, such as the trunk or the limbs; but health is the uniform and regular performance of all the functions of the body, arising from the harmonious action of all its parts—a physical condition implying that all are sound, well-fitting, and well-matched. Young minds do not look far enough into life to see this distinction, or to value it if seen; they fix their eyes longingly upon *strength*—upon strength *now*, and care not for the power to work long, to work well, to work successfully hereafter, which is Health. Therefore it is fortunate that the same means which usually give strength give health also; although the latter may be *jeopardized by irregular* efforts to obtain want of the soldier as they were in the days of Xenophon, of Caesar, of Napoleon. But the purposes and practices of war are not the all in all with us as they were with the Greeks and Romans; nor are the whole of our able-bodied men under arms, nor the whole of our youths preparing for conscriptive battalions, as were the youths of Germany and France in the last century. Our own army, scattered over the whole globe, and encountering the severities of every clime, claims but a fraction of our men; a small portion only of our youths are in uniform; but other occupations, other habits, other demands upon mind and body, advance claims as urgent as ever were pressed upon the soldier in ancient or modern times. From the nursery to the school, from the school to the college or to the world beyond, the brain and nerve strain goes on—continuous, augmenting, intensifying. Scholarships, competitive examinations, speculations, promotions, excitements, stimulations, long hours of work, late hours of rest, jaded frames, weary brains, jarring nerves—all intensified and intensifying—seek in modern times for the antidote to be found alone in physical action. These are the exigencies of the campaign of life for the great bulk of our youths, to be encountered in the schoolroom, in the study, in the court of law, in the hospital, and in the day and night visitations to court and alley and lane; and the hardships encountered in these fields of warfare hit as hard and as suddenly, sap as insidiously, destroy as mercilessly, as the night-march, the scanty ration, the toil, the struggle, or the weapon of a warlike enemy.

Yes, it is *health* rather than *strength* that is the great requirement of modern men at modern occupations; it is not the power to travel great distances, carry great burdens, lift great weights, or overcome great material than ever of late years, but never so strongly, never so sadly, never in its every aspect so impressively, as in the death of a late statesman, eminent alike for the height of his intellectual attainments, the nobleness and purity of his aspirations, and the gentleness and almost feminine sweetness of his character. He sank in early manhood, with his great career just begun, his great works but outlined by his hand; to other hands was left their accomplishment, to other hearts their fulfilment, and all for want of a little of that bodily stamina, a little of that material hardihood, a little of that power of enduring fatigue, which he was, even as he failed, seeking to extend, through the means of this system of bodily training, to every soldier in the land.

This need of such a preparation for the coming struggle of manhood in these times of high civilization and intellectual advancement being then so apparent, what is the great hindrance to the due training of the body? It is to be found in the too *exclusive* cultivation and employment of the mind; in the long and continuous hours of physical inaction with extreme mental effort and inordinate mental stimulation, which the requirements and educational demands of the present day often involve; in the overlooking or ignoring of the fact that the body also has urgent and distinct claims to culture and employment.

Are these two then opposed? Is a healthy, energetic, and vigorous frame incompatible with a powerful and vigorous intellect? We know that it is not so. Science and experience alike confirm the fact that the two are not only compatible, but that the one is in every case an aid to the other. That the intellect can rarely attain, or if it already possesses, can rarely long retain a commanding height when the bodily functions are impaired;

the former. Again, it is fortunate that this most desirable of all earthly possessions should spring from the regular and uniform development of the body as a whole, not from the extreme development of any special part. Vast strength of limb may be found united to a comparatively feeble trunk, a massive trunk to dwarfish limbs, great muscular force to delicate lungs. These alike reveal local power and local weakness, and these are not the developments which yield Health.

Let both man and boy therefore cultivate strength by every available means, but let it be general not partial strength. The Battle of Life requires for combatant the *whole* man, not a part; and the whole too in as good condition as can be brought into the conflict.

There is no profession, there is no calling or occupation in which men can be engaged, there is no position in life, no state in which a man can be placed, in which a fairly developed frame will not be valuable to him; there are many of these, even the most purely and highly intellectual, in which it is essential to success; essential, simply as a means, material but none the less imperative, to enable the mind to do its work. Year by year, almost day by day, we see men falter and fail in the midst of their labours—men to whom labour is life, and idleness is death—men who with a negation of self and self-comfort even unto martyrdom, devote themselves to great purposes and great works, and before their completion fail; men who run the life-race with feet winged with the purest faith and hearts full of the noblest hope, and who, with the goal in view, falter and fail; and all for want of a little bodily stamina—a little bodily power and bodily capacity for the endurance of fatigue or protracted unrest or anxiety or grief. Strongly *has this* been ever impressed upon me, more strongly cultivation or exercise of the mind be neglected, it will of necessity be weakened in precisely the same manner as the other organs are weakened by insufficient use, will deteriorate both in strength and vigour and the power of enduring fatigue. If, on the other hand, the exercise of the brain be excessive, beyond the point where the nutrition is equal to the waste, it will suffer in the same way and to the same extent as the other organs would do.

It would be well if parents would ask themselves at the outset what is their object in the training of their children. 'They wish them to be thoroughly educated,' would probably be the response. Then let their first care be that the body shall be healthy and fairly grown. Let them take care that the mind shall receive that amount of culture which will develop and strengthen it, but let them pause at that point where exercise and application are merging into fatigue; so shall it attain its utmost attainable point of strength and vigour, so shall it reach its highest attainable capacity of enduring exertion and effort. Year by year will it be found to increase in these attributes, and in the aftertime, if a call for extra exertion should come, it will not come upon it unprepared. And more than this, the body having received its due share of cultivation also, will itself be gaining year by year, and while contributing to the health of the mind by its own health, will be able to endure successfully its allotted amount of labour, in whatever position of life, under whatever sun, it may toil. Nor let parents imagine that their sons who are destined to what are, chiefly or exclusively, sedentary professions, need not so much preparation for their coming life. The clergyman, the physician, the barrister, re often called upon to endure even as much bodily fatigue as the soldier or the sailor, and the numerous premature failures among all these classes show how needful such preparation is and how little the necessity has been recognized.

And yet how often do we find parents stimulating by every imaginable method, and by every suggestive expedient, the mental cultivation of their children; inciting them to take from the hours that should be given to physical exercise and to physical recreation, and to devote them to study. What is it these parents are seeking ? Is it the future welfare of their children, or is it (let us examine it closely) the gratification of their own pride in their children's superior talents and intellectual attainments ? It has been said that the pride of parents in their children is, of all kinds of pride, the most excusable ; but even our pride in our children may have many phases, and that phase cannot be a purely unselfish one which would risk ultimate health and happiness for temporary distinction, praise, and admiration.

The very interest evinced in the premature development of intellectual ability is dangerous to the young, appealing as it does to one of the most powerful stimulants in the youthful mind, the love of praise and notoriety. Boys soon learn to love the excitement which such an artificial mode of life produces, and cease to feel any interest in, or any desire for, the active pursuits usually so dear to youth. Others there are thus forced into abnormal advancement, who work on reluctantly to the end, but once emancipated, the distasteful task is for ever abandoned. Which of these is most deserving of our pity, the unnatural young hermit, who in his books alone takes delight, or the too natural little Arab to whom books and book-learning have become a thing of disgust? Most parents have at some time or other felt a pang of alarm at seeing their child turn with carelessness from the food which they knew to be necessary to its well-being. I have frequently experienced the same feeling at seeing a child turn with indifference or dislike from the sports and pursuits of his companions to creep back to his books; and also as much alarm, mingled with anger—for false and cruel must have been the teaching which caused the dislike—at seeing the healthy and strong child turn with repugnance from his books[1].

Earnestly however as I desire to advocate the cultivation of the bodily powers, I would guard against its being thought that I would neglect cultivating to their full capacity the mental ones. That would only be erring in another direction, and although a safer one in some important respects, important as regards present comfort and future health, it is still altogether erring; and the right path is broad and open and plain, free alike to all who will look for it with unprejudiced eyes. The brain also requires systematic and ample exercise to develop its attainable powers, and where there exists no unusual weakness, its reasonable culture can scarcely begin too soon or be pursued too steadily. Putting aside the necessity in these days for a highly comprehensive education, a degree of mental culture proportioned with careful hand to the age and mental and physical capacity will be found to act with advantage to the latter, and the relish and zest for bodily exercise, which supplies fatigue as the soldier or the sailor, and the numerous premature failures among all these classes show how needful such preparation is and how little the necessity has been recognized.

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[1] 'My boy works seven hours a day regularly, sometimes eight,' said a lady to me composedly. The boy had just turned his eighth year. Four languages besides his own, Latin and Greek, French and German, with History, Geography, Arithmetic, and Instrumental Music! Were his headaches *real or sham*, I wonder?

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Now this must be error, error arising from ignorance of our very selves. Mind and body should be viewed as the two well-fitting halves of a perfect whole, designed in true accord mutually to sustain and support each other, and each worthy of our unwearied care and unstinted attention, to be given with a fuller faith and more reverent trust than they have who would argue that He who united in us our twofold nature made them incompatible, inharmonious, opposed. No, no; even blind and blundering man does not yoke two oxen together to pull *against* each other. Mind and body can pull well together in the same team if the burden be fairly adjusted.

'Brute force,' 'brute strength,' are terms we constantly hear used, *despisingly, of bodily* power when it is designed *to contrast it with mental* ability; just as we hear the most valuable of all incentives, will be increased by it. The giving of a large part of the day to exclusive bodily occupations is, to my mind, for those who are to take a place in the educated world, an equal error—a rejecting of the advantages of civilization. The body makes no such exacting demands. Let it not therefore be inferred that I would undervalue the purely mental work of schools, nor let it be for a moment imagined that I would advocate a less active, a less energetic, a less earnest pursuit of it. On the contrary, it is because I value it at its highest price, and because I would sustain in their most ardent efforts its youthful votaries, and enable them in the aftertime to reap to the full the fruit of their labours, that I plead for a more discriminating indulgence in occupations purely mental and sedentary at this period of life. For there is no error more profound, or productive of more evil, than that which views the bodily and mental powers as antithetical and opposed, and which imagines that the culture of the one must be made at the expense of the other. The truth is precisely the reverse of this. In the acquirement of bodily health mental occupation is a helpful, indeed a necessary, agent. And so impressively has this been proved to me, that in cases where the acquisition of bodily health and strength was the all in all desired by the parent, and the one thing longed for by the child (and in some cases almost despaired of by myself), I have been careful to allot and mark out a proportion of mental with bodily occupation.

Schools, large and small, are yet to be found where the exclusive bookworm is an object of admiration and wonderment, and masters and parents unite in stimulating his industry and lauding his progress. But *every* sensible man feels for him but commiseration, varied list, such as no other country can produce, and upon which every Englishman looks with pride and affection, for they mould the characters as well as the frames of our youths ; and the man who invented cricket as surely, to my mind, deserves a statue to his memory as he who won Waterloo. The influence of our national games upon the national character is valuable beyond computation: nothing could take their place, nothing could atone for their loss.

But valuable as these exercises are—invaluable as they are—it will be at once seen that not one of them has for *object* the development of the body, or even the giving to it, or to any part of it, health or strength: although all of them, in a greater or less degree, undoubtedly have this effect, it is indirectly and incidentally only—the skill, the art, is the first consideration. And in this, as purely recreative exercise, lies their chief value, the forgetfulness of self, the game being all in all.

Out of this great good there arises, I will not say an evil, but a want, a defect. The parts of the body which have to execute the movements of such exercises are those which can do them best, not those which need employment most. Use gives facility of execution, and facility of execution causes frequency of practice; because we all like to do that which we can do well: and thus inevitably, because based on the organic law of development being in relation to activity or employment, certain parts of the body will be cultivated and become developed to the exclusion of the others. So certainly is this the case, that it is as easy to tell from the general development of any youth what recreative exercise he has practised when at school, as it is to tell from the *conformation of the* chest whether a man pulls *on the bow or the stroke side* of his College boat, when the holder of an opposite opinion, and possessor of opposite acquirements, talk sneeringly of the 'mere scholar.' But they who speak thus err equally in their praise and in their blame. They seek to sever what were bound together in the very planning, if one may so speak on such a subject, of a living man; they disunite them, and then complain that the dissevered halves are of unequal value; they take the one and cultivate it exclusively, and neglect the other exclusively, and then make comparisons between them; forgetting that their fitness, each for the other, lay in the fair nurture of both, and in their mutual cultivation. Thus we hear of men who think out great thoughts, and work out great conceptions, and who yet in their material frames have not the stamina of a healthy child; just as we see the opposite—men with frames so strong and so hardy and enduring, that incessant toil can scarcely fatigue, and rest alone seems to tire them, yet of mental calibre so small that the intellect seems scarcely adequate to provide for the safety of the mortal machine confided to its care. But either condition is equally the result of error, and either development is equally a monstrosity, although the former is less repellent than the latter, and less humiliating to our intellectual aspirations.

But to return to the school-boy. It is not alone in a negative form, by exemption from extreme mental efforts, that the growth and development of his body is to be secured. Active bodily exercise, at regular and frequent intervals, must be obtained, and for this special provision must be made with as serious a purpose as for any school duty.

All Exercise may be classed under two distinct heads, Recreative and Educational. The first of these embraces all our school-games, sports and pastimes; a long and

Recreative exercises then, from their very nature, are inadequate to produce the uniform and harmonious development of the entire frame, because the employment which they give is essentially partial. Where the activity is, there will be the development; and if this principle be overlooked, a portion of the body only will be cultivated and the neglected portion will fall far behind the others in strength, in activity, in dexterity, and in endurance, for the simple reason that it will be less abundantly nourished.

Recreative exercise in sufficient amount is usually in itself sufficient to maintain health and strength after growth and development are completed, but it does not meet the many wants of the rapidly-changing and plastic frames of youths spending a large portion of their time in the constrained positions of study; taking shape almost day by day from day-to-day occupations. Hence the necessity for a system of Educational Exercises. It is the office, as it is entirely within the reach, of systematized exercise to modify the growth and distribute the resources of the body so that each particular part shall have its legitimate share, and so to increase these resources that each part of the growing frame shall have its wants supplied.

The one great reason why systematized exercise is not always appreciated or recognized is, that its special nature and object, its susceptibility of gradation to meet the requirements of individuals, and its effect upon the different structures of the human frame, are imperfectly understood. Its effects upon any part but the muscular system are seldom taken into consideration; its vast influence over the other systems, and especially on the organs *employed in the vital* processes of respiration, *circulation and nutrition, seldom* appreciated. The evils he comes to the University. It will be found that the lower limbs and right arm have the lion's share of the employment or exercise in almost every one of our recreative exercises. They largely employ the lower half of the body, and where the upper limbs are employed, or the trunk, it is almost exclusively the right side[1]. These distinctive features in our national recreative exercises have the inevitable tendency to develop the lower half of the body to the neglect of the upper; and this is most distinctly apparent to every eye; the lower limbs are usually large and not infrequently massive, while the upper region is usually small and not infrequently irregularly and imperfectly developed, narrow, flat, and, as it were, compressible: it is, in very many cases, years behind the lower limbs in all that constitutes growth and development. Indeed, I almost daily find in my professional life men in whom this inharmonious development is so great, that the upper limbs and upper region of the trunk, and the lower region and lower limbs, scarcely seem to be the halves of the same individual. And while at any time, amongst the hundreds of men and boys whom I have daily under my care, I might find it difficult to point to one in whom this lower half was really faultily grown, I could with painful facility point to dozens in whom the upper was distorted from its proper conformation[2].

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[1] Thus:—

Football—the lower limbs.

Cricket—the lower limbs do the hardest work of the game, the right arm the remainder.

Rowing—the lower limbs and loin.

Racquets, Tennis, Fives—the lower limbs. Fives is played with both hands, but the left has an inferior part.

Fencing—the lower limbs and right arm.

Walking, Running, and Leaping—the lower limbs.

[2] See Appendix A.

Get the strong limbs and shapely frame, and a little, a very little, will keep them so; get the strong heart and ample lungs set in the fair-proportioned and elastic chest, and a little, a very little, will keep them so—not more than the busiest life can spare, not more than the gravest mind would seek for mental recreation and beguilement—a daily walk or ride, an occasional break into the country with gun or fishing-rod or alpenstock. But if these are no more than sufficient for the healthy and the strong, what hope, what chance remains for those who have been allowed to grow up feeble and imperfectly developed? How can *they* expect to encounter the wear and tear, the 'jar and fret,' inevitable in the path of every working man?

There are many forms of mal-growth, more or less grave, to be seen in every school, all demanding rectification, all susceptible of being rectified during this period of life by systematized exercise. I would instance particularly *Pigeon-breast*[1], or undue prominence of the breast-bone, accompanied usually by flatness of the ribs of the upper region of the chest. I have been able to trace this mal-formation of chest to several causes, such as tight clothing during infancy and childhood, and in many instances to the straining coughs which attend what are familiarly called children's complaints, i.e. Hooping Cough, Measles, Dentition, &c. *Hollow-breast*[1], which is the obverse conformation of *Pigeon-breast* in front, accompanied usually by the same flattening of the ribs. This is usually produced by causes similar to the preceding. *Drooping-shoulders*[1], sufficiently expressed in its name, and produced by shoulder-straps or any arrangement of bands or bandages which confined the action of the shoulder-joint in child-arising from this imperfect comprehension of an agent so important to the healthy growth and development of the young are manifold and increasing—increasing in the ratio of man's intellectual advancement; because so long as it is believed that systematized exercise gives but muscular power, gives that and that only, few of those engaged in purely intellectual pursuits would care to cultivate it, even could they do so without effort, and fewer still would give to it that effort which its attainment demands. And that for this simple reason, that great muscular power would be to a man so situated comparatively without value.

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[1] See *Appendix A.*

But if it can be proved that this muscular power is but one result of systematized exercise, and that not its highest—if it can be shown that properly-regulated exercise can be brought to bear directly upon the other systems of the body, and especially upon the delicate and important structures which encase and contain the vital organs, and on whose fair and full development the health and functional ability of these organs must greatly depend through life, then such exercise takes another rank, becomes as valuable to the man who works with his brain as to him who works with his hands, and will be sought for with a desire proportionate to his intelligence, because it will enable him to prolong and sustain his labours with safety to himself and increased value to his fellow-men. But this culture should be obtained in youth, during the period of the body's growth, when every organ and every limb and every tissue and every bone are advancing to occupy their ultimate place and position—while all is plastic and moving, changing and capable of being changed. This is the time for all culture, mental and physical, and most emphatically so for the latter.

this purpose; and as the muscles can only maintain their contractile power by frequent and varied exercise, they cannot do this duty if they are denied that which is necessary to their functional ability. This law, which does not apply to these parts alone, but to every part of the body, is markedly seen in the muscles of the trunk. Were these duly exercised, stooping would be impossible, that is, continuous stooping, which involves the origin of many evils of development. Because, if the muscles of this region possessed their proper degree of power, they would of course perform adequately their functions—and one of these is to keep the body upright. It is as useless therefore to tell a boy thus imperfectly developed 'not to stoop' as to forbid him to cough when he has a cold, or to limp when he is lame.

Another abnormal form of growth, but much less frequent, is the opposite to the foregoing—is where the frame seems stunted from its natural height. This dwarfed and arrested growth will be found to have arisen in the majority of cases from some cause which interfered with the proper nutrition of the general system, and it in consequence may be inferred that any means which will restore this condition will restore the naturally attainable capacity for growth and development in the frame, so far as this may yet be extended over the natural period of growth still remaining[1].

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[1] A remarkable instance of this came under my observation a few years ago. A youth whose growth had for some time been stationary at the height of 5 ft. 2⅝ in., suddenly from the practice of systematized exercise began to grow at a fair and regular rate, and at the age of 21, when he went to India, his height was 5 ft. 6¼ in. Another instance is that of a schoolboy whose growth had been all but arrested from a severe fall *in childhood.* Almost instantly systematized *exercise started his latent powers* of growth, and in nine months he *had grown 8⅞ in.*

hood. *Stooping*, which at the same time implies such a manner of carrying the head and neck and upper portion of the trunk, as that they are not in a line with the rest of the column of the body—the chief evil consequence attending the position being the depression of the upper part of the thorax in front. With these may be named some of the forms of *Spinal Curvature*[1], often proximately due to weakness of the dorsal muscles or to inordinate and unregulated growth. Rapid growth itself, if unattended by relative development, is not only in itself an evil, but is the source of many others. It is no uncommon thing to find a lad at school growing at the rate of six or eight inches in the year. Now it may be stated that the smaller of these numbers is incompatible with fair development and health; the whole resources of the body are drawn in one direction, furthering one process, the upward growth. Nay, when this process is extreme it will be seen to be most intensified up the centre of the body, an idea that might seem fanciful were it not almost daily presented to me as a fact[1].

Another feature of rapid upward growth is that the chest scarcely expands at all during the process. It will be seen to run up from the waist without any expansion whatever[1], while the shoulders fold round to the front, and the head stoops forward from the base of the column of the neck; and seldom does a straight spine accompany such abnormal growth. I have known the chest actually diminish in girth—grow narrower and narrower—as if it were tightened up by the extreme elongation of the general frame. Now the reason for these displacements is, that all these parts are held in their respective places by certain muscles arranged for and as a recoverable debt the youth may fairly view it[1]. A large instalment of it he may obtain almost immediately. I find that during the first Term (two months), with properly-administered systematized exercise, the chest will expand, under all ordinary circumstances, two inches, and under peculiar circumstances I have known it reach double that amount. The general rule also is that where the chest has been neglected and is consequently in arrears in development, the arms and shoulders will have shared the neglect and so of course show a proportionate want of development. And these, as they share in all the work of the chest—are in fact the medium through which the chest receives almost all its exercise—share in the gain proportionately. Now had these parts received an adequate share of employment up to this time this sudden development would be impossible; and it must have been arrears of expansion, otherwise the rate of increase would be sustained after the first Term, which is not the case.

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[1] See Appendix A.

But it is not only, or even chiefly, for the faultily-grown, the imperfectly-developed, and the weak—although to these it is a necessity, a necessity if they are ever to be strong—that I plead for the regular adoption of a system of educational bodily exercise in our Schools. What should we think of that schoolmaster, who, because a boy was apt and capable, and for his years well-instructed, would therefore and thenceforward leave him to his own resources and inclinations? Yet in truth similar are the reasons we constantly hear adduced when physical culture is mentioned. We hear men say, 'All exercise should be free, should be voluntary, should be left entirely to a boy's own choice, inclinations, and disposition.' Do we leave him the same licence with the other agents of health? his diet, for instance, or his hours of rest or of study? Yet none of these are more important to his welfare and well-being, present and future, than exercise[1]. Whatever may be the developed capacity of the untrained body, it is as far from the symmetry and strength to which it may attain with proper culture, as is the clever but self-taught man from what he would have been with thorough educational training. Certain points in his character stand out large and prominent, powerful in a given line of action, but others are dwarfed and stunted, and show the more meanly from the prominence of others. So it is with physical development and with physical culture: the assiduous and exclusive application to a favourite exercise will strengthen and develop the parts engaged in its practice, but this presupposes the neglect of the remainder, and the result in both cases, the mental and the physical, will be the same—inharmoniousness, incompleteness.

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[1] See Appendix D.

It might be a task not unworthy the attention of medical men to inquire if this partial and inharmonious condition of bodily development is not the cause of many forms of debility and also of some of the active ailments of life—the origin of the phrase, so pregnant with meaning, though happily not of literal accuracy, that 'every man has his weak part.' Indeed, I should be disposed to consider the man whose frame is generally and uniformly weak, safer than he whose frame is partially and locally strong, because the natural tendency is to gauge and estimate the general strength by the power of the strongest part. And just as the strength of a rope or chain is but equal to its weakest part, and just as the dependence will be on the general strength of the rope or chain, and its weak point be unnoted until its failure, so will the voice of the weak part of the human body be silenced by the general claims of the rest until the time of exposure and trial.

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[1] In fact there are many boys, more than one inexperienced in such points would easily believe, who if left to their own inclinations take no exercise at all, or take it so listlessly that the results are *nil*. Yet these are the very boys that need exercise the most of all, and their reluctance to enter upon it, and feebleness and awkwardness in pursuing it, are the strongest proof of their great need of it, the strongest *proof that as boys* they are not living boys' lives—and the boy's life *leads to the man's*.

England may well be proud of her Public Schools, for no other country has anything comparable with them, indeed has neither the schools nor the scholars, nor the families nor the firesides from which the scholars are drawn. For we must go far back—far as the home-habits and home-teaching of ancestors in forgotten generations—if we would get at the origin of character. Out of England we never find boys, only little men, embryo soldiers, lawyers, and doctors, with the specialities of their avocations sprouting upon them; and their schools have nothing in common with ours, present no point of resemblance. The Public Schools of England are to it what the heart is to the human body—the centre and source of its vitality and power, the spot through which its life-blood flows, from which is distributed to every spot, near or far, the young, fresh, bright stream to strengthen, to revivify, and to renew.

I have dwelt thus long upon what I conceive to be the necessity of providing a regular system of physical education in connexion with the purely mental culture of schools, because it is at this period of life, and it is under a school régime that it is most needed, and would *most powerfully influence* health and strength, *present and future.* And I have spoken thus strongly of what I conceive to be the error and the danger of exclusive or undue culture either of mind or body, because it is at this period of life, and it is under such circumstances, that the deepest and most lasting impressions are received and the most enduring tastes and habits acquired; habits and tastes that will almost inevitably be carried into succeeding stages of life, and be intensified at every stage. In the University this is markedly the case; here the youth who at school devoted his time and his thoughts exclusively to study, leads an existence still more artificial, now become to him almost a natural one, for the law of adaptability smooths down many things that are irksome when first essayed. Being now free, or, more correctly speaking, having now none to over-rule and few to advise, he follows his own inclinations, and this the more keenly that these are the same which have already guided him to distinction. He came up with a school reputation for ability, and this must be preserved, must be confirmed and extended, for school-honours are not the fee, only the earnest-money, of the bargain yet to be fulfilled; its éclat is only the god-speed encouragement at a hopeful starting, not the congratulatory cheer at triumph gained. And no one knows this better than the youth himself, and better than himself no one knows that not by talents alone, not by genius alone, was he enabled to plant his foot on the vantage-ground which he occupies, not by these, but by labour; and knowing this he believes that what he thought necessary before to win, is no less necessary now to keep; so the old rule of exclusive brain-work is re-begun. All the early day he reads; only in the afternoon does he go outside the College walls, and then only for a hurried, feverish walk—a very nightmare counterfeit of true exercise to the wants of a frame like his. His lamp is lit at the setting of the sun and scarcely extinguished at its rising. Does he never think when the wick is burned down and the oil is consumed, when the one is renewed and the other is replenished, does he never think, I wonder, as he sits with the wet towel round his forehead and sips his green tea, stimulating and urging the weary brain to greater effort, that the lamp of life within *him* needs trimming and renewing?

What is the other extreme? for we read in the evidence laid before the Public School Commissioners that boys who expect to excel at cricket must spend seven hours a day in the cricket-field. 'My boy shall cultivate his *body*.' Parents may have their wishes in this direction carried further than they anticipated. 'My son spends his days on the river,' writes one to me, a clergyman with his quiver well filled, 'his success in life depends on his success at Oxford, and I tremble as the time approaches for him to go into the Schools.'

These are two extremes, but they divide not the University between them. The devoted bookworm and the devoted athlete are equally removed from another class—a fast diminishing one let it be thankfully recorded—a class which cultivates neither mind nor body, with whom the day is frittered away and the night dissipated, with whom time passes without purpose, or profit, or pleasure;—at least such purpose as a man should deign to pursue, and such pleasures as he should condescend to accept. Nothing now, leading to nothing hereafter; the mental advantage nothing, the physical advantage something less than nothing. 'Why cumbereth he the ground?' Year by year, term by term, this class is diminishing. Year by year, term by term, its antithesis is increasing, the true class, the true men, the men well worth devoting life to form, the cl well worth devoting life to increase. For as the boo worm has his antithesis in the enthusiast athlete, has the idler his in another type, in the man who fee that he *is* a man, a man with a body as well as a brai muscles as well as nerves, and who has no intentio of sacrificing either to the other, or either for the othe even if such immolation could be to its advantag But he knows to the contrary, he feels to the contrar He feels and knows that by friendly rivalry and inte change of labour and of rest both are benefited; th each may be fully cultivated without infringement the privileges of its companion, but rather to the mutual gain and well-being. Therefore he has n intention to hazard brain-fever or break-down of an kind from reckless mental effort, just as he has n intention to subject himself to the ignominy of a po sible failure in the Schools. He has no faith in delayin until the last minute and then, as the phrase goe 'reading his head off.' He has still less in 'passing b dint of good luck.' And he has least of all in trustin to 'natural sharpness' which on mythical occasions reputed to have 'floored the Examiners.' He know that there is a given amount of work to be done i a given time, and he knows he can do it if he begi at once, and with regulated effort works steadily on the end. And this he means to do, and this he does.

I select for illustration the Universities thus speciall as they are perhaps more distinctly an extension school-life than the early stages of any of the professio or callings which imply intellectual labour for actu employment; and because it is there I have been ab to test by practical observation, over a very long perio the opinions I now venture to advance. A comple change in a boy's habits we occasionally see, an utter reversal of all antecedent tastes we sometimes hear of, but, in the great majority of cases, school-habits and school-tastes become consolidated and confirmed into traits distinguishing more advanced life. In more senses than one the boy is father to the man.'

In the second stage, the one immediately succeeding school-life, while the upward growth, although nearly at its close, is still going on, an amount of benefit, second only to that obtainable in boyhood, may be obtained from the regular practice of systematized exercise. It matters not whether the youth be reading for a University degree, or has passed at once to his future profession, his frame is still growing, still changing, still pliant, still impressionable, still liable to be checked in its natural development, and stunted or turned aside from its true proportions, by inactive, sedentary, or exclusively mental pursuits, and still capable of having growth and development powerfully stimulated, and still susceptible of being rapidly advanced healthward by systematized exercise.

As life advances, and as the frame becomes mature, with all its structures complete and consolidated, susceptibility of material change diminishes, and actual gain in bodily power is comparatively uncertain and slow[1]. But there is no period of active life in which

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[1] It is however a noteworthy fact, and one showing with rather startling emphasis the truth of the adage, that 'every rule has its exception,' that of the first five hundred names on the book of the Oxford Gymnasium the greatest increase in development is made by a man in his thirty-sixth year.

	Age.	Height.	Weight.	Chest.	Fore arm.	Upper arm.
	Yrs.	ft. in.	st. lbs.	in.	in.	in.
Oct. 22nd, 1862	35	5 8⅝	9 0	32	9	10¾
Dec. 21st, 1862	,,	5 8¾	9 13	36½	10⅞	11⅞

a man may not profit by systematized exercise if judiciously pursued; only let him use the same discretion in this as he would in practising any exercise of any other kind, abiding by the simple movements of the earlier courses, and leaving to lither limbs and more elastic frames those where the demand for effort is sudden or great[1]. And let him not be disappointed if his progress is slow, or discouraged if he sees younger men passing him on the road; he must remember that he starts late, and it is with him at best the alternative of 'better late than never;' but late is late and implies disadvantage; he is trying to do, as well as he can, what could only have been done perfectly in its proper season, and that has passed away. The educational time of mind and body is the same, the *growing time*; but just as we see men whose opportunities of mental culture in early life have been small or neglected, in a measure retrieve the loss by later efforts, so may the neglected culture of the body also be retrieved by after endeavours, if judiciously and perseveringly made.

A most important principle in Exercise, and one which should ever be borne in mind, is, that it should be regulated by individual fitness, for the exercise that scarcely amounts to exertion in one person will be injurious and dangerous to another[2]. And not only is this inequality observable among different individuals, but, as we have already seen, the same individual may have parts of his body possessing special power or presenting special weakness. A man may have limbs capable of transporting him at the rate of four miles an hour throughout the day, and for many days in succession, but with heart or lungs all unequal to the effort. Or he may have an organization so frail, and a temperament so susceptible to stimulation or excitement, that the one is an abiding danger to the other.

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[1] The first course of the system may be freely and almost unconditionally recommended to men throughout what may be called middle life; care being taken to use a bell and bar well within the physical capacity. The best time for this practice is in the early morning, immediately after the bath, and when regularly taken it need not extend over more than a few minutes.

[2] A painful instance of this nature was brought before me some time ago. A man boasted to me that he and his son—the father a strong hardy man, the son a lanky and loose-grown lad of thirteen years—had just walked from London to Oxford in one day—a distance of nearly sixty miles. Before the year was out they made another

It is every man's duty therefore (nor is it a very hard one) to endeavour to ascertain the nature and extent of his physical resources for his guidance at all times, but especially when contemplating any special and exceptional exertion. And it is from the non-observance of this principle that we hear so frequently of accidents and cases of serious indisposition after unwonted physical effort. If any one whose habits of life have been of a comparatively sedentary nature, suddenly, and without any preliminary preparation, resolves to change these habits for active ones, he will unquestionably derive harm from such an attempt, simply because, in doing so, he is infringing those principles which alone can make it useful. Thus, if he attempts an exercise which is suited to one whose frame, from regular and continuous practice, is capable of performing it without fatigue; if he makes a demand upon his heart and lungs that is beyond their power to sustain, because he sees another man make the same requisition upon *his* well-trained organs of respiration and circulation; or if he selects a certain time of the day

journey together—a short one this time—the son carried before, the father, broken-hearted, following. The boy had never recovered from the exhaustion of that day.

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A most important principle in Exercise, and one which should ever be borne in mind, is, that it should be regulated by individual fitness, for the exercise that scarcely amounts to exertion in one person will be injurious and dangerous to another[2]. And not only is among the very men who need it most and to whom it will yield the most immediate and lasting benefit; a custom which if adopted judiciously will give a healthful fillip to the flagging energies of both mind and body. We call it 'change of air,' and the term is just as good as any other, but it very imperfectly expresses the extent of the change, for it is change of everything—everything we see or hear, taste, touch, or look at, person, place, or thing—change of everything we undertake, undergo, and (probably) understand.

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[2] A painful instance of this nature was brought before me some time ago. A man boasted to me that he and his son—the father a strong hardy man, the son a lanky and loose-grown lad of thirteen years—had just walked from London to Oxford in one day—a distance of nearly sixty miles. Before the year was out they made another

But even when these holiday-breaks are made most sensibly they must not be regarded as the all in all of the exercise to be taken. A man cannot in a week or two eat sufficient food to supply the demands of appetite for a whole year, neither can he take sufficient exercise to keep his body in health throughout the four seasons in a summer's ramble. These mountain excursions or sea-side sojourns must be *in addition* to, and involving no curtailment of, the daily walk to or from business, the daily ride to or from somewhere, or the daily employment with or at something; a something which will in its doing quicken the pulse and augment the breathing, and, if possible, bring the perspiration to the forehead.

Exercise may be favourably connected with other agents of health, such as bathing, in the practice of swimming; and with fresh air in country ride or ramble. To men living in large cities—the men of course whose need of exercise is the greatest—it seems but a tantalization to recommend a country ramble; but there are a great many men pining for want of proper exercise who do not live in large cities, and there are a great many others who spend but a portion of their time there, with whom an occasional break along the green lanes in the saddle, or across the meadows on foot, would be a matter of easy accomplishment. Men do not know what they possess in these cross-country by-ways, and in the power of traversing them on foot—the pleasure, the profit of walking—the first exercise enjoyed in life, the last that is freely taken. But a walk to be a real enjoyable exercise must be a country walk, a country ramble in fact—the antithesis to the 'constitutional' of a measured mile of way on the dusty road—going where fancy prompts and inclination leads, forgetting alike past mental labour and present physical effort in the successively recurring objects of interest that will rise at every turn of the path. The country walk is an exercise entirely our own—purely English—originating doubtless in many favourably concurring circumstances, mental and material; such as love of country-life and country-scenes, of natural objects in their natural places and in their natural aspects, and also from that blending of the thoughtful with the practical elements of character which is peculiar to our own race; and doubtless also to the facilities presented for indulging in by-path pedestrian peregrinations. I have wandered on foot through many a land, but have never seen these dear old stile-paths in any but our own, nor have I ever met abroad the man who cared for them, or could comprehend any pleasure in this source and this scene of exercise. The country walk is good for both mind and body, clearing the brain, and quickening the pulse by the same means. If a man wanted an aid to thought, a help to enable him to look all round a point difficult of access, and at the same time find the antidote to close mental application, I would say, 'Vault the first stile in the first meadow and let your mind track out the windings of the way of your subject of thought, even as your undirected feet might track out the windings of the unsurveyed path on the greensward—through meadow and field, through coppice or common, by river-side or plantation-row—the villager's right of way, secured to him by right of immemorial usage.' For the young and for the middle-aged, for the one as a change from his more energetic and concentrated physical exertions, for the other as a means of bodily exercise and mental beguilement, I know no better recreation.

I have spoken of the irregular and indiscreet yieldings to the natural instinct for physical exertion which is to be found in almost every nature—subdued, it may be, but not dead—and waking up and asserting their claims on every favourable occasion; but the evils which come from these are not so great or so startling in their results, nor do they seem so blameable a transgression, as when these instinctive cravings are blindly and persistently ignored. How many, how marked and how painful, are the proofs of this, daily recurring! How many gifted men have broken down and are daily breaking down with their life's work only half done, when they might, humanly speaking, have completed it with ease and success, had they not carried it on in utter disregard of the fact that to ensure health of mind they must possess health of body, and at the same time set at naught the laws which the Creator of each has made the conditions of its healthful existence!

I do not need here to quote from the long list of men of every rank and profession whose useful and valuable careers have been brought to an untimely close by death, or more often, and perhaps more sadly still, by the permanent ill-health which baffles all medical skill and science. Numerous are the instances which have fallen under my *own notice* of individuals who would be a matter of easy accomplishment. Men do not know what they possess in these cross-country byways, and in the power of traversing them on foot—the pleasure, the profit of walking—the first exercise enjoyed in life, the last that is freely taken. But a walk to be a real enjoyable exercise must be a country walk, a country ramble in fact—the antithesis to the 'constitutional' of a measured mile of way on the dusty road—going where fancy prompts and inclination leads, forgetting alike past mental labour and present physical effort in the successively recurring objects of interest that will rise at every turn of the path. The country walk is an exercise entirely our own—purely English—originating doubtless in many favourably concurring circumstances, mental and material; such as love of country-life and country-scenes, of natural objects in their natural places and in their natural aspects, and also from that blending of the thoughtful with the practical elements of character which is peculiar to our own race; and doubtless also to the facilities presented for indulging in by-path pedestrian peregrinations. I have wandered on foot through many a land, but have never seen these dear old stile-paths in any but our own, nor have I ever met abroad the man who cared for them, or could comprehend any pleasure in this source and this scene of exercise. The country walk is good for both mind and body, clearing the brain, and quickening the pulse by the same means. If a man wanted an aid to thought, a help to enable him to look all round a point difficult of access, and at the same time find the antidote to close mental application, I would say, 'Vault the first stile in the first meadow and let your mind track out the windings of the way of your subject of thought, even as your men who spend the whole day, and, it may be said, every day throughout the year in the same round of occupations, and to whom not even the once-a-year holiday of a week or two in summer is allowed. To men thus employed systematized exercise conducted on a rational system would be of incalculable value.

Gymnasia organized for the use of this class of learners, however, would have special difficulties to encounter, for here would be absent the control which would be available in school gymnasia, and the habitual discipline observed in military ones. For it must not be forgotten that there is always to be found, in every group of men or boys, some who are more eager for momentary distinction than for permanent improvement; always some whose efforts, if not judiciously controlled, would be determined by susceptibility to excitement rather than by bodily power; and where the attendance would be entirely voluntary, the management of such learners becomes doubly difficult. Indeed there is but one means of obviating such difficulty, and that is by a system where the exercises are carefully graduated and strictly progressive; where every man, weak or strong, would work within the actual circuit of his own capacity. Another difficulty with, or rather drawback to, these Gymnasia is, that the time available for recreation with men engaged in business is almost limited to the evening, the time least desirable for exercise, for then the bodily energies have become depressed, and the mental faculties subdued—the time and the condition when the mind is least able to stimulate the physical effort, and when physical effort reacts least favourably on the mind. But this is a difficulty that in a measure is already passing; social changes are from year to year taking place which are rendering the continuous hours of labour in many occupations less severe and less prolonged. Employers, it is found, have not been ruined, as was sagely anticipated, by the early closing of offices and shops, and the Saturday half-holiday has neither undermined the morals nor ruined the constitutions of those to whom it has been extended.

And here again the educational aspect of systematized exercise assumes its true importance; an importance resting not only on the stronger frames and greater energies with which it would endow every man—a priceless capital to carry into his avocations—but also on the bias, the taste, and the inclination which it would give in adult life, prompting to the employment of leisure in healthful and manly recreation.

At the very outset, however, I perceived that there were two distinct directions in which a rational system of bodily training might be carried with special advantage. In the Army, because bodily power, hardihood and activity are the very essence of the soldier's life: and in our Schools, because, as I have already tried to show, *that* is the time and *there* the régime which present the greatest facilities for bodily culture.

It needs but a glance to see that the men who fill the ranks of our Army are drawn from almost every species of trade, occupation, and calling, and embrace almost every grade of physical power; massive, powerful men from the farm, the quarry, the forge, the warehouse, and the wharf; and slight, half-formed, half-fed youths from the factory, the shop-counter, the desk, and from the innumerable petty trades in which men find employment in closely populated districts. I believe it may be roundly stated that every occupation followed in this country is represented in the Army; and, if what I have stated regarding Exercise and its results be correct, to state that every form of occupation in this country is represented in the Army is virtually to state that every form of growth and development is represented there also. (I mean of course within those limitations observed in the enlistment of recruits and subsequent medical examination.) Now most of the occupations in which artisans and labourers are engaged give active and powerful employment to certain parts of the body, the other parts receiving comparatively little; and the inevitable result of this unequal employment is unequal development, because power is in relation to activity. The parts that have been actively employed will be shapely and strong; the inactive, neglected parts will be weak and stunted. And this will be evident to every eye that knows what proportions to look for: the nature of the employment leaves its mark upon the man for good or for evil—a sign, a seal, in witness of his strength and beauty, or a brand denoting his weakness and deformity—fashions him, moulds him, for shapeliness or distortion, so unerringly, that to the experienced eye the nature of the craft or calling is instantly revealed; or, the occupation being known, you may tell before looking at the man the condition and the direction of his development. In men drawn from so wide a field will be found every gradation of physical strength, the strongest and the weakest. To take the two extremes for illustration, and to begin with the man of large stature and powerful frame; how has he acquired this powerful frame? Chiefly by energetic and powerful exercise. Other things may have contributed, indeed must have contributed, such as abundant diet, and, probably, fresh air; but neither of these, nor both of these, nor all the other agents of health put together, will give muscular power without muscular employment. Now remove such a man suddenly from his occupation, take him to the dépôt to be straightened and taught to march with his head upright, his arms close in by his sides, and the trunk of his body held erect and motionless as a pillar, and what are you doing? That which is suitable and necessary to enable the man to take his place in the ranks as a soldier, but nothing whatever to sustain, far less augment, his bodily energies. The constrained position, the restricted and closely localized movements of parade and drill, all deny to the trunk of the body and the upper limbs any exercise whatever, any share whatever of that which has given them the strength which they possess, for a continuation of which they are pining, without which they must dwindle, to the loss of their shape, and size, and power, and the still more important loss to other parts of the body depending for their health and activity upon the health and activity of these. But there is another condition of large stature and rapid growth which I would desire to instance; I mean the man of large frame with little strength, the results usually of a strong and unsubduable germ of growth in the individual, which, with adequate diet and suitable and abundant exercise, produces those splendid specimens of men whom we are fain to view as the type of our race, but who, with an inadequate or irregular supply of these agents during the period of their upward growth, attain the bulk of frame, but miss the soundness of constitution and the physical energies which should accompany it. There are many of these men in the Army—there must ever be many of these men in the Army. We have only to think for a moment of the insufficiency of diet alone, insufficiency in quantity and quality, at a time when abundance was a necessity to either present or prospective health or strength, to know that we have got the *shell* of the man only. Sound. strong. or lasting he cannot be, because in him we have distributed over a large surface that which is only adequate for a small one. Is it possible yet to restore him to the place he was designed to occupy. designed by the incontrovertible evidence of his stature attained in spite of his deprivations? Is it possible to give him that soundness of constitution, energy of muscle, elasticity of action, and symmetry of form which were his by birthright? Not possible—not possible to give after growth is completed that which should have been regulated by growth itself, beginning with its beginning, adding to, proportioning, consolidating, and sustaining every cell of every fibre or tissue. as it was added to the frame; but still possible, still feasible, still a certainty, yet to recover a valuable portion of the health and strength, activity and energy of which he has been deprived; still possible to double his material well-being as a man, to double his serviceability as a soldier. At once, the first day he is recognized in the dépôt as an embryo soldier, let him be taken to the Gymnasium, prepared, fitted, built for his reception and use; let him be placed under the care of instructors taught to administer exercise on a clearly defined and comprehensive system, a system calculated to meet the requirements of every learner, weak or strong, to meet the requirements of the whole frame of every learner, and to give to the whole frame suitable and uniform and adequate employment. Let this be done and there will be created within him a new growth, a new life; a growth for the rectification of all that is wrong. and for the strengthening of all that put together, will give muscular power without muscular employment. Now remove such a man suddenly from his occupation, take him to the dépôt to be straightened and taught to march with his head upright, his arms close in by his sides, and the trunk of his body held erect and motionless as a pillar, and what are you doing? 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It is this inadequacy, this partiality of exercise employed without reference to this law, which renders gymnastics or systematized exercise so variable here; for by it only can employment suitable in nature, degree, or duration for every part of the body be provided; and while the comprehension of this law teaches us how to look for partial developments and defective and imperfect growth, it has but to be ascertained what these local wants are, what parts of the body are relatively weaker than the remainder, and such employment can be furnished as will raise any such part to the rank of the rest of the body in strength and in serviceability. And when the entire body is below the point of power to which it should have attained, suitable employment can be furnished for every part of the whole collectively—employment that can be increased and intensified with the advancing capacity of the learner. And it must never be forgotten that in developing a limb to its full power and perfect conformation, we do that, and, except indirectly, we do nothing more; whereas a glance at the trunk of the body will show that in developing the parts of which it is composed, (I might almost say, constructed, so numerous are its parts and so complex is their arrangement) we do that and a great deal more. We not only develop to their normal shape, size, and capacity, the important muscles of the trunk, but at the same time, and by the same process, we bring to its perfect shape and size the framework which encases and protects those vital organs, whose health and functional power we know to be all-important. The health of these organs, and their power of performing their functions with due completeness, are essentially dependent upon their perfect freedom; and this freedom they cannot have if confined and restricted by the narrowness, or other deviation from the natural shape and size, of this enclosing framework; they cannot attain to their full size and power if thus fettered, and no activity on their part can do other than aggravate the evil of their confinement. In thus providing therefore for their freedom in functional activity by the expansion of the chamber in which they lie, we directly aid in their development, directly increase their power.

But can I prove, can I adduce any evidence, that the system of bodily training which I advocate would meet the end desired, would adjust and regulate and place under his control the entire available resources of the strong, would take up the comparatively unformed, undeveloped, and altogether negative frame of the youth, and cultivate him into an energetic, active, and strong man? I have no hesitation whatever in saying that it will do both of these, and I believe I can give sufficient evidence that I do not over-estimate its power.

Many years ago I instituted a series of measurements, by which I could ascertain the state of the development of all pupils at the commencement of their instruction, and these measurements being repeated at given intervals, I could know the rate of their advancement. The revelations made by this system of periodic measurements have been such as to sustain me in devoting my energies to the completion and extension of this system of exercise. I find that to all, child or adult, weak or strong, it gives an impetus, a momentum in the development of his resources, which nothing else can give; and which nothing can take away, because it is not a thing acquired, a mere mental or physical addition;—it is the man altered, the man improved, the man brought nearer to the state he was designed to hold by the nature of his organization. And I think I cannot do better than give the instance of those soldiers who first received a course of training on this system[1].

The first detachment of non-commissioned officers, twelve in number, sent to me to qualify as Instructors for the Army were selected from all branches of the service. They ranged between nineteen and twenty-nine years of age, between five feet five inches and six feet in height, between nine stone two pounds and twelve stone six pounds in weight, and had seen from two to twelve years' service. I confess I felt greatly discomfited at the appearance of this detachment, so different in every physical attribute; I perceived the difficulty, the very great difficulty, of working them in the same squad at the same exercises; and the unfitness of some of them for a duty so special as the instruction of beginners in a new system of bodily exercise—a system in which I have found it necessary to lay down as an absolute rule, that every exercise in every lesson shall be executed in its perfect form by the instructor, previous to the attempt of the learner; knowing from experience how important is example in the acquisition of all physical movements, and how widely the exercises might miss of their object if unworthily represented by an inferior instructor. But I also saw that the detachment presented perhaps as fair a sample of the

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[1] See *Appendix E.*

Army as it was possible to obtain in the same number of men, and that if I closely observed the results of the system upon these men, the weak and the strong, the short and the tall, the robust and the delicate, I should be furnished with a fair idea of what would be the results of the system upon the Army at large. I therefore received the detachment just as it stood, and following my method of periodic measurements[1], I carefully ascertained and registered the developments of each at the commencement of his course of instruction, and at certain intervals throughout its progress[2].

The muscular additions to the arms and shoulders and the expansion of the chest were so great as to have absolutely a ludicrous and embarrassing result, for before the fourth month several of the men could not get into their uniforms, jackets and tunics, without assistance, and when they had got them on they could not get them to meet down the middle by a hand's breadth. In a month more they could not get into them at all, and new clothing had to be procured, pending the arrival of which the men had to go to and from the Gymnasium in their great coats. One of these men had gained five inches in actual girth of chest. Now, who shall tell the value of these five inches of chest, five inches of additional space for the heart and lungs to work in? There is no computing its value, no power of computing it at all: and before such an addition as this could be made to this part of the body, the whole frame must have received a proportionate gain. For the exercises of the system are addressed to the whole body, and to the whole body equally, and before this addition could be made to the chest every spot and point of the frame must have been improved also—every organ within the body must have been proportionately strengthened.

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[1] See Appendix H.

[2] A tabular statement of these measurements was published in the Blue-book of the year, and are here given at length in Appendix E. And the increase there shown has been proportionately sustained wherever the system has been carried out, as I am informed by Colonel (now Major-General) Hammersley, late Director of Gymnastics in the Army, and as are shown in the regular returns of measurements furnished to him from the different Gymnasia.

But I tried another method of recording the results of the exercises. I had these men photographed naked to the waist shortly after the beginning of the course and again at its close; and the change in all, even in these small portraits, is very distinct, and most notably so in the youngest, a youth of nineteen, and as I had anticipated in him, not merely in the acquisition of muscle, but in a re-adjustment and expansion of the osseous framework upon which the muscles are distributed.

But there was one change—the greatest of all—and to which all other changes are but means to an end, are but evidences more or less distinct that this end has been accomplished, a change which I could not record, which can never be recorded, but which was to me, and to all who had ever seen the men, most impressively evident; and that was the change in bodily activity, dexterity, presence of mind, and endurance of fatigue; a change a hundredfold more impressive than anything the tape measure or the weighing chair can ever reveal.

Up to this point I have spoken but of the beneficial results of exercise as affecting the man, without special reference to his professional duties as a soldier; and I have done so purposely, because it is thus far that systematized exercise is valuable to all alike, and also

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Up to this point I have spoken but of the beneficial results of exercise as affecting the man, without special reference to his professional duties as a soldier; and I have done so purposely, because it is thus far that systematized exercise is valuable to all alike, and also because it will in a moment be seen that the power of the man and the serviceability of the soldier are inseparable conditions. Our embodied idea of energy, activity, and strength, is the soldier, these qualities trained to, made subservient to, the exigencies of his profession; and these qualities are the inevitable results, the incontrovertible results of that system of bodily training which I advocate, because the system itself is based upon, and all its directions are in accordance with, the natural laws which govern the growth and development of the human body. Endow a man with these qualities, therefore, and you endow him with the power of overcoming all difficulties against which such qualities can be brought to bear, against all difficulties requiring strength, activity, energy, dexterity, presence of mind, tenacity, and endurance. You cannot limit a high qualification to a single use any more than you can limit the purpose to which a good coin may be applied; it will fetch its value anywhere and in anything. And so will strong muscles and sound lungs—in garrison, in camp, or on campaign, on the march, in the field, in the transport, in the hospital, or any service, in any climate.

And while this is applicable to the soldiers of every country, how much more so, with how much greater force, does it apply to our own, who have to pass from station to station over the whole world, who have to endure the extremes of every climate, from the almost arctic cold of Canada to the tropical heat of Africa and the Indies. If physical energy and constitutional strength be the essence of power in the soldier of any other nation, they must be so with peculiar distinctness in our own, who have to exercise their profession over almost every country on the face of the globe, and to endure the hardships, the fatigues, the discomforts of them all.

The same qualities which are so valuable to the soldier are no less valuable to the youths who are about to enter on the campaign of intellectual life. It matters little whether the fight is to be fought out in the plains of India, or in the green lanes of a country parish in England. I shall never forget the reply of a soldier to a question of mine, when inspecting the first squad of men who had passed through a brief course of training at the gymnasium at Warley Barracks. I asked him if he felt any stronger for his practice. 'I feel twice the man I did, Sir,' was his reply; on my further asking him what he meant by that—'I feel twice the man I did for anything a man can be set to do.'

It was just that. The man was stronger; therefore he was not more able for this thing or that thing only, but for 'anything which a man could be set to do.'

Before entering into the principles which guided me in the preparation of the system of bodily training which I here advocate, it may be interesting to glance briefly at those of other countries, where the advantages of such systematic physical training have been sometime recognized, and means have been adopted to supply it.

The first attempt in modern times at a system of bodily training differed as widely as it is possible to conceive from that of the ancients. The ancient system, as we have seen, was adopted solely to give strength to the already strong, and dexterity to the already active, but made no provision for, advanced no aid to, the feeble, or inactive, or ailing. It must have been a strong conviction of this shortcoming that warped the judgement and overheated the imagination of Ling, the enthusiast Swede, *when* he gave the freewill-offering of a laborious life to the preparation of a system of bodily exercise in its main characteristics suitable to invalids only.

With the perseverance peculiar to the possessor of a new idea or of an unique and all-absorbing subject of study, a quality which often outstrips genius in the career of usefulness, he laboured, unwearied and unrelaxing, elaborating and exemplifying the principles of his Free Exercises. Accepting that Exercise is the direct source of bodily strength and that Exercise consists of muscular movement, he therefore conceived that movement—mere motions, if they could be so systematized that they could be made to embrace the whole muscular system, would be sufficient for the development of the whole bodily powers. Carrying out this principle still further and extending its operation to those who from physical weakness were incapable of executing these movements of themselves, he argued that *passive* Exercise might be obtained; that is, Exercise by the assistance of a second person or operator, skilfully manipulating, or moving in the natural manner of its voluntary muscular action, the limb or part of the body to which it is desired the exercise should be administered.

That this last application of his theory is sound, and most valuable for the cure and amelioration of many species of ailment and infirmity, I have had the most abundant evidence supplied by my own experience. That the first is altogether erroneous has been no less fully made plain to me. The error is so deep-seated and so all-pervading, that it lies in a misconception not only of what Exercise is, but of the necessity of administering it with a reference to the condition of the individual, on the plain and accepted principle which governs the administration of every other agent of health. And to argue that a given mode of Exercise is fit for the healthy and strong, because it is found to be beneficial to the ailing and the delicate, is to argue against all rule and precedent.

But the system of Ling, incomplete, inadequate as it was, possessed *one* of the essentials of Exercise; and therefore as soon as it was instituted good sprang from it, and good report was heard of it; and after much disheartening delay, and many rude official rebuffs, Ling saw it accepted by his country[1]. And this must be viewed as the first attempt to bring a knowledge of the structure and functions of the human body to bear upon its culture, the first attempt to lift such culture above the mere 'do them good' of other men.

The echo of this good report was heard in Germany[2]; and Prussia, eager to avail herself of every agent which could strengthen her army, adopted it, with some additions and limitations, to form a part of the training of her recruits. But, going even beyond Ling, the supporters of the Prussian system maintain that a *few* carefully selected movements and positions alone are sufficient for the development of the human frame, and, 'simplicity' being the object chiefly held in view, this system aims merely at giving a few Exercises, these to be executed 'with great precision[3].'

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[1] The Central Academy of Gymnastics at Stockholm was instituted in 1814.

[2] Of late years many improvements and alterations have of course been made in the systems of continental countries as well as in our own, but the systems here described as in vogue in France and Germany in 1860 are interesting as having had their bearing on that adopted by our own army (v. page xcii), and the description of them is therefore retained here.—Ed.

[3] Official report, *Gymnastics, 1860.*

There is no change in any art or branch of science, custom or usage, common to ancient or modern times, so great as in these systems of bodily Exercise. The ancient was all for the cultivation of individual energy, individual strength, individual courage; the modern aims at giving to a number of men acting in concert, the lifeless, effortless precision of a well-directed machine.

But the Prussian soldier's period of service is so short (three years) that every agent to hasten his efficiency must be seized; and it has been found necessary to provide means, in the shape of large buildings resembling riding schools, in which drill may be carried on throughout the year. And as this gymnastic system is viewed but as drill, aims but at being drill, it is, in winter, carried on in these buildings, the few articles of apparatus employed, for the sake of the advantages which they specially offer to the soldier, being erected in a corner of them. And this continuity of practice increases manifold whatever good it can yield; and thus meagre and inadequate as it is, its fruits are valuable. It is found that no other form of drill so rapidly converts the recruit into the trained soldier, and the greatest importance is attached to its extension throughout the army[1].

There is a general impression that this system forms the basis of the French. It would be difficult to make a greater mistake; for not only have they, either in principle or practice, nothing in common, but in many respects they are the very antithesis of each other. So far from the boasted 'simplicity' of the Prussian system, and the desire to limit it to 'a few Exercises to be executed with great precision,' being adopted by the French, they have elaborated their system to such an extent that it is difficult to say where it begins or where it ends, or to tell not what it does, but what it does not, embrace. For quite apart, and in addition to, an extended range of Exercises with and without apparatus, it embraces all defensive Exercises, with bayonet and sword, stick, foil, fist, and foot, swimming, dancing, and singing, reading, writing, and arithmetic, if not the use of the globes. The soldier is taught to throw bullets and bars of iron; he is taught to walk on stilts and on pegs of wood driven into the ground; he is taught to push, to pull, and to wrestle; and although the boxing which he is taught will never enable him to hit an adversary, he is taught manfully to hit himself, first on the right breast, then on the left, and then on both together, with both hands at once; and last, but not least, he is taught to kick himself behind, of which performance I have seen Monsieur as proud as if he were ignominiously expelling an invader from the *sol sacré* of La Belle France. Now I know no particular reason why a soldier should not be taught all these acquirements, and I know many important reasons why he should be taught some of them; but it would be difficult to assign any reason, either important or particular, why they should be called Gymnastics, or be included in a system of bodily training.

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[1] The Central School of Gymnastics was first established in Berlin in 1847.

The fundamental idea of the French system is sound, for it embodies that of preparation and application; it is primarily divided into two parts—*Exercices Élémentaires*, and *Exercices d'Application*. The first of these, designed to be a preparation and prelude to the instruction and practice on the fixed apparatus, begin with a long series of Exercises of movement and position, *propres à l'assouplissement.* What is this all-important process of *assouplissement*—this idea; shared at home as well as abroad, by civilian as well as soldier, of the necessity of suppling a man before strengthening him? What is it to supple a man? What parts of him are affected by the process and what change do they undergo? It would be very desirable to have these questions answered, because want of suppleness is a common subject of complaint, and though often caused by apparently different processes has really but one origin.

To ascertain the full meaning of a word or phrase, it is sometimes useful first to ascertain its opposite or antithesis; and the opposite of to be *supple* is, I think, to be *stiff*. If any one is in doubt as to what that means, let him take a day's ride on a hired hack along a country road, or, for the space of a working day, perch himself upon an office-stool, and the results will be identical and indubitable—stiffness in the column of the body and in the lower limbs. And why? Because each and every part so affected has been employed in a manner out of accordance with its natural laws. The joints, which are made for motion, which retain their power of motion only by frequent motion, have been held motionless. The muscles, which move the joints by the contraction and relaxation of their fibres, have been subjected to an unvaried preservation of the one state or the other—the muscles of the trunk in unremitting contraction, those of the limbs in effortless relaxation. Now, one of the most important of the laws which govern muscular action is, that it shall be exerted but for a limited continuous space, and that, unless the relaxation of the muscles shortly follows upon their contraction, fatigue will arise as readily, and to as great an extent, from want of this necessary interruption to contraction as from extent of effort. And, strictly speaking, this stiffness both in trunk and limbs, although arising from two opposite states of muscular employment, results from the same cause, i.e. exhaustion; each has had one only of the two essential conditions of muscular action, that one being therefore in excess. The stiffness in the trunk of the body is caused by the ceaseless contraction of the muscles, and this state is not conducive to the rapid local circulation indispensable to the reproduction of the force expended. The opposite phase of stiffness, arising from continuous muscular relaxation, is the immediate result of causes which may be called negative—the non-requirement of nervous stimulus, the non-employment of muscular effort, entailing subdued local circulation.

The second cause of this stiffness in the trunk of the body and limbs is, that the joints have been held motionless. Viewing the joints in the familiar light of hinges, we know that when these are left unused and unoiled for any length of time, they grate and creak and move stiffly; and the hinges of the human body do just the same thing, and from the same cause; and they not only require frequent oiling to enable them to move easily, but they *are* oiled every time they are put in motion, and when they are put in motion only; the membrane which secretes this oil, and pours it forth over the opposing surfaces of the bones and the overlying ligaments, is stimulated to activity only by the motion of the joint itself.

But, it may be argued, stiffness may arise from extreme physical exertion, which has embraced both conditions of muscular action, with frequent motion of the joints, stiffness such as a man may experience after a day of unwonted exercise. The stiffness in this case, also, is simply temporary local exhaustion of power from extreme effort: the demand suddenly made has been greater than the power to supply—the waste greater than the renewal.

Stiffness, therefore, appears to be, first, a want of contractile power in the muscles which move the joints; and secondly, a want of power in the joints to be moved. It may be temporary stiffness, arising from exhaustion of the parts by extreme or unnatural action, as in the illustrations just given; or it may be permanent stiffness, arising from weakness of the parts, caused by insufficient or unsuitable exercise; but the nature of both is identical. It is a lack of functional ability in the parts affected.

To supple a man therefore is, first, to increase the contractile power of his muscles; and secondly, to increase the mobility of his joints. And as the latter are moved by the former—can only be moved by the former—all application for this purpose should be made through them.

Now, even although mere movements and positions were altogether adequate materially to develop the muscular system—materially to add to its contractile power, there is a still greater drawback than mere insufficiency in their effect upon the joints; and that is, in the danger of straining, and otherwise weakening the inelastic ligamentary bindings. For every effort of mere position has the simple and sole effect of stretching that which, from its organic structure, object, and place in the human body, is not stretchable—is not intended to yield. To recapitulate: all exercises of mere position act directly on the joints, instead of acting on them through the muscles. Such exercise is, therefore, addressed to the wrong part of the body; it is addressed to the joint, when it should be addressed to that which moves the joint. It is the old and exploded treatment of disease revived for the treatment of an abnormal physical condition—subduing the symptoms instead of waging war with the cause.

The other exercises in this first division of the French system—even if they were valuable, even if they were capable of being classified under any distinct head, or arranged in any progressive order, or admitted of graduated instruction and practice—are entirely out of place here, because from their nature they court and incite to inordinate effort. It needs no argument to prove the inconsistency of directing that men, sitting or standing, hand to hand, or foot to foot, singly or in batches, shall strain and strive against men, lift cannon-shot and hold them out at arm's length 'as long as possible[1],' or sling them to their feet to cast them to a distance 'as far as possible,' before they are allowed to put hand or foot on an ordinary ladder inclined against a wall, or to walk along a plank raised a foot or two from the ground. It needs no argument to show that this is reversing the order of exercise when measured by the amount of effort, local or general, required for its performance.

The second division of the system, consisting of applied or practical exercises (*Exercices d'Application*), embraces a very extended series, to be executed on a wide range of apparatus; and it may be broadly stated that all these exercises are valuable in either an elementary or a practical aspect—that is, either as they are calculated to cultivate the physical resources of the man, or as they may be applied to the professional duties of the soldier. I repeat, that the exercises of this division of the system are intrinsically valuable in one or other of these aspects; but it must ever be viewed as a grave error, that, so far from the special aspect of each being designated, so far from their being separated and grouped, each under its proper head, they are all retained under one head, under the single designation of 'Practical Gymnastics.'

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[1] 'Instruction pour l'Enseignement de la Gymnastique dans les corps de Troupes et dans les Etablissements Militaires.'—Paris, 1847.

The evil which naturally and inevitably springs from this want of arrangement is the undue importance which it gives to all exercises of a merely practically useful character, above those whose object is the training and strengthening of the body. This is emphatically the case in the earlier stages of the practice, where the whole attention of the instructor should be devoted to the giving, and the whole effort of the learner should be devoted to the acquiring, of bodily power. Increase the physical resources first, and the useful application will follow as a matter of course. A pair of strong limbs will walk north as well as south, up hill as well as down dale—the point is to get the strong limbs.

Let not this principle of classification be undervalued. The question of 'What's the good of it when I've done it?' is one not unheard in the Gymnasium, and one not always easy to answer; and even could you be at all times ready with a physiological explanation of motive, process, and result, your questioner is not always a man who could understand it, and the difficulty is enormously increased when the exercise questioned has place among others of the practical value of which there can be no question. But such classification gives at once the answer; 'It is of no use at all as a thing acquired; but if you should never do it or see it done again in all your life to come, it has served its purpose; for *you* are altered, *you* are improved, *you* are strengthened, by the act and effort of learning it.'

But men so intelligent as those, who are entrusted with the administration of the French system, have perceived the propriety of a special application of the exercises practised at the close of the course of instruction. And, therefore, to the bona fide exercises of the system are added certain practices in which the men are employed in 'storming works,' and in undergoing an examination of their general proficiency.

These are the main features of the French system—a system of bodily exercise, but not a system of bodily training; based on, in many respects, erroneous principles of physical culture, yet productive of great benefit, physically and morally, to the soldier: with much that is useless, much that is frivolous, much that is misplaced and misapplied, and much that has no claim whatever to be admitted into any system of bodily exercise, military or civil—yet, upon the whole, national in tone and spirit, and, as has been proved by the avidity with which it has been practised, not unsuited for the men for whom it has been organized[1].

I have gone thus far into the principles of these two systems because they may be said to embody those of all continental nations, wherever a series of bodily exercises has been adopted for the distinct purpose of physical training. In pointing out the errors, shortcomings, and inconsistencies of these systems, it will have been apparent that they all spring from one cause—the absence of any clear theory of exercise itself, of any clear comprehension of what it is, of what changes it effects in the human frame, or of its mode of accomplishing them. It is now many years since I was impressed with this conviction; for before the formal adoption of either of the two last mentioned systems by their respective Governments, the elements of which they are composed were known and irregularly practised. I was impressed with the conviction, that until a theory of Exercise based upon a knowledge of the structure and functions of the body, and in perfect accordance with the laws which govern its growth and development, were formed, no system of bodily culture, deserving of the name, could be established.

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[1] The French System of Gymnastic Exercises was organized in 1847; and the Central School, near Vincennes, was founded in 1852.

The system which I advocate is the result of my professional life—developed and matured by every means which I could bring to bear upon it by physiological theory or practical test. The period of its preparation extends over nearly a quarter of a century, for during that period I have been, as it were, standing in the midst of a living stream of men and boys flowing in from every school, public and private, in the kingdom; youths possessing every degree of physical power—presenting every phase of physical weakness. On these, *by* these, every exercise in the system has been tested; its nature, its character defined and its results ascertained, its place in the progressive courses slowly and carefully determined[1].

When called upon therefore to provide a system of bodily exercise for the Army, I had but to add a military application to this educational one; for, whereas the purely educational system stops at the first aim, viz. the cultivation of the body only, leaving the after-use of this power to be determined by the individual wants of the possessor, a military system should be two-fold, aiming first at cultivating the body to its highest attainable capacity, and then at teaching the manner in which this physical power may be applied to professional purposes.

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[1] The same care and method has been employed in arranging all the new exercises introduced into the System.—Ed.

A military system of bodily training should be so comprehensive that it should be adapted to all stages of the professional career of the soldier; should take up the undeveloped frame of the young recruit as he is brought to the dépôt, and be to him in all respects a system of culture—a system gradual, uniform, and progressive—a continual rise from the first exercise to the last, in which every exercise has its individual and special use, its individual and appropriate place, which none other can fill, in the general system;—a system of exercises which will give elasticity to his limbs, strength to his muscles, mobility to his joints, and above all, and with infinitely greater force than all, which will promote the expansion of those parts of the body, and stimulate to healthy activity those organs of the body, whose fair conformation, health, and strength will double the value of all his after life; which will give him the vital stamina that will be to him a capital upon which he is to depend, and from which he is to draw at all times, at all seasons, and under all circumstances of trial, or privation, or toil. This should be the great object to be aimed at in the early stages of the system; the strengthening, the developing of his body, muscle and joint, organ and limb; make him a man, and as a man give him power over himself. Give him that, and you give him the Malakhoff of the position; the activities, the dexterities of the art will fall into his hands.

And then, but not till then, should the practical application begin—an exposition, earnest, ample, and varied, which will show him how every article of commonest use may be utilized on emergencies to important purposes, how obstacles of every form and character may be surmounted, and how burdens of every size, and shape, and weight may be borne; which will show him also—and he will now see without much showing—how every exercise in the system has added something to this end, contributed something to this attainment, two-fold in its character, single in its object, to strengthen the man in order to perfect the soldier.

Thus the military aspect of Gymnastics has retained its importance in modern times. On the continent and in our own country the military authorities have been the first to recognize the importance of systematized bodily training, and a military application of the advantages to be derived from bodily strength has thus preceded its educational or civil one. It formed, as we have seen, the bona fide military training of the youth of Greece and Rome. In modern times it was adopted by Germany to increase the value of her fast-diminishing soldiers at a time when the land was drained of its youth and of its manhood to guard the frontier. It was adopted by France from the love of activity and dexterity inherent in her sons, and their eagerness for all that tends to cultivate these qualities; and it was adopted by our own military authorities from, I think, equally national characteristics, on the strong representation that it would contribute greatly to the health and strength, moral and physical, of the Army. Slowly and cautiously was this adoption made, and on confirmation of its value it has been introduced and carried out with a completeness unequalled in any country or at any time.

An important principle in this system, a principle perhaps the most important of all, has been that it shall be conducted by instructors properly qualified and supervised by officers regularly appointed and personally and practically acquainted with the system. This also has been carried out with equal method and completeness. Two detachments of non-commissioned officers, under the command of the officer selected by the authorities to direct its introduction and conduct its future extension—an officer specially selected for his high qualifications for the difficult work of introducing into the Army a new and hitherto entirely untried institution—were sent to Oxford to be qualified as instructors, and thence removed to Aldershot to form a normal school for the preparation of other teachers, and form the centre of the military gymnastic system [1].

I have been thus minute in tracing in outline the principal features of the introduction of our military system that it might be seen how far a regular system of bodily training has been carried out, and with what solidity it has been established in this country, and the importance in which it is held by the military authorities, who of all men are the most capable of estimating the value of health and strength, and of the means of obtaining them.

Now if all this arrangement and method is considered necessary in the organization of the bodily exercise of full-grown men—men of mature frame and hardy habit, and at the period of life when all the physical energies are at their highest point of power, at least as much precaution and forethought and method should surely be adopted on its administration with boys and lads at school, whose frames are all incomplete and impressionable in the highest degree;—capable of being affected for good or for evil by every surrounding agency.

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[1] The Gymnasium at Aldershot, built on the plan of the Oxford Gymnasium, was organized in 1861.

It should be clearly understood by every one entrusted with the care of boys that nothing can be put up in the form of actual apparatus which would be either useful or safe without adherence to a regular system, and the instruction and supervision of an efficient teacher. And I would warn every one so entrusted and contemplating such erections that little but evil can spring from neglect of the caution. I do so with an earnestness which I could only feel, and with an emphasis I could only use when the good to be obtained was at best but trifling and uncertain, and the evil to be hazarded great and undoubted. For what but evil can accrue from the untaught, undirected efforts of a group of boys, strong and weak indiscriminately mingled, gathered around the cluster of perilous machines sometimes erected in a playground and styled a Gymnasium; the strong improvising tricks which have nothing to recommend them but their danger, the weak emulating the strong? And the evil which is most to be dreaded, viz. *strains*, is precisely the very evil which should not occur—the very evil which with properly administered gymnastics *could* not occur,—which in my entire professional experience, with the thousands of young and old, weak and strong, who have passed through my hands, has never in the smallest degree occurred,—the very evil in fact which should be prevented from occurring in other exercises, even by the resultant benefits of these, because by them the parts liable to injury on effort would be strengthened and an inherited liability removed; for the universal law regulating growth and development is paramount here—*the natural and suitable exercise strengthens, the excessive* *or undue exercise weakens and injures.* I repeat, falls and broken bones are not the evils to be dreaded from these hazardous exertions. Falls are seen, and broken bones can be mended; the thing to be feared is the strain from sudden, unregulated, or over-stimulated effort; an evil which at the time of its actual occurrence may never be known, or if known, concealed, for the young have a dread of such incapacitating injuries; but which whether concealed or revealed, understood or misapprehended, felt late or soon, will surely appear, it may be to mar the hope and the happiness and the usefulness of all the life to come.

The educational system as here given aims at providing a regular and progressive course of bodily training to every healthy frame at any period between childhood and adult life. I expressly say healthy frame, because although it contains many of the exercises which are suitable to the delicate or ailing, yet no rules or regulations can be laid down for the administration of exercise in such cases; this must always be done with special reference to the capacity and requirement of the individual, and, indeed, varied of necessity to suit his bodily condition from day to day. A system less complete and less definitely arranged would not meet the ends in view, would not give that guarantee to parents, and, to those who have the care of boys, that sense of immunity from danger, which is only to be obtained from a mode of bodily exertion in which every movement is pre-arranged and every possible mishap foreseen; —would not enable teachers, merely practically qualified, to carry out a plan of educational exercises with classes of learners of different ages and different degrees of bodily power. And a system less extended and varied would not present to learners that sustained attraction and interest which is essential to true advancement. For while the teacher adheres to his book of instructions and follows faithfully the carefully graduated and strictly progressive courses as they are there laid down, the learner will never be working in advance of his capacity; his ability to enter upon a new course will be determined by his ability to perform that which preceded it, the earlier exercises of the one being but slightly removed in difficulty from the later ones of the other. And thus will the learner advance from exercise to exercise, from series to series, from course to course,—from the preliminary movements of the first lesson to the most complicated and arduous exercises of the last; his rate of advancement being always regulated by his growing capacity and strength.

But, it is said, boys have not the time for such systematic bodily culture. It might be permitted perhaps to say in reply that boys have the time for anything which is found desirable or necessary for them to do or to learn, and I have been endeavouring to show that the culture of the physical powers should accompany the culture of the mental ones, if we would cultivate either to the greatest advantage—that is, cultivate them in accordance with the laws which determine the growth and health of both. But let us see how much time is required for this purpose—for this duty, let me call it. Let us see how much time is occupied by it in schools where the system is and has been for years regularly practised. The whole school is separated into divisions arranged, so far as possible, according to age and physical capacity; each division has one regularly appointed day in each week for its lesson in the gymnasium; each division again, on the day of the lesson, is subdivided into classes, the boys of each class being determined on the same principles as those which regulated the primary divisions, but with a still closer regard to individual capacity. Each separate class on the day of instruction, having its own teacher, is conducted by him through the course of exercises appointed as suitable for it. By this means, as all the boys in a class are of similar capacity, the exercises being suitable to one are suitable to all; and by the same rule every boy in the school is virtually receiving instruction and practice in that course of exercise most suitable to his individual requirements. This is the regular lesson, but on occasions of wet or inclement weather, or when deprived of their expected recreative exercise, boys may attend the gymnasium as a voluntary class on either of the other lesson-days.

Now what is the actual demand made here upon a boy's time? *One hour per week.* And this under ordinary circumstances and under ordinary conditions of health and growth is all that is required. But this implies that it will be begun early, begun with school-life, and through school-life continued.

In these arrangements there is one point which should be borne in mind, namely, that the lesson should *not* be taken from what is called play-time. *Nothing* should be taken from play-time, and nothing should be introduced into play-time but play. The lesson should be taken from actual school-time and should be regarded and reckoned as actual school-work. This alone, as a rule, will win from boys that spirit of earnestness in its practice, and yield to it that unenforced but none the less effectual means of discipline which real work claims and secures[1].

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[1] This plan I pursue in my own school, and with the most satisfactory result. Not only does the lesson take place in the regular

These are the arrangements for large schools where provision is made for the complete bodily culture of boys of all ages and stages of growth, from the earliest years at which boys leave home up to manhood. But the system is just as capable of being carried out in the smallest school as the largest. The introductory course alone, performed on the schoolroom floor, would be excellent training for young boys, and excellent preparation for the more advanced courses suitable to later years and fitter for larger schools. And the progressive courses of the system may be as strictly followed on the most meagre selection of apparatus, as in the most fully appointed gymnasium.

I ought perhaps before closing this chapter to take some notice of the performances sometimes styled gymnastics, which have in late years obtained an undesirable degree of notoriety, because in these I recognize a distinct hindrance to a correct conception of what gymnastic exercises really are, and what they aim at doing. I allude to the dangerous and purely sensational performances in vogue at many places of amusement, which have nothing to recommend them but the peril and hazard to the life and limb of the performer at which they are performed, and the gratification of a morbid and unhealthy passion for excitement in the spectator. While such performances and such exhibitions bear the name and designation of gymnastics, all earnest-minded men, eager for the extension of true physical culture, will have a serious and irritating evil to encounter. There are very many persons who have not the inclination, even when they have the power, to separate the

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school-time, but the boys are marked on the same scale, and in the same manner, for their conduct and position in the class, as for any ordinary school-lesson.

spurious from the real—the baneful from the beneficial, and are content to take things as they appear, or as they are represented to them: and these may well say and well think, 'if such performances as these are gymnastics, the less our boys at our English schools know of them the better.'

No. In our day if gymnastics mean anything—that is, anything worth the serious thought of parent, teacher, or pupil—they mean a gradual, progressive system of physical exercise, so conceived, so arranged, and so administered, that it will naturally and uniformly call forth and cultivate the latent powers and capacities of the body, even as the mental faculties are developed and strengthened by mental culture and mental exercise.

SYSTEM OF EXERCISES

PRINCIPLES

OF THE

SYSTEM OF EXERCISES.

THE Exercises forming the courses of this System are arranged progressively, commencing with the most simple and initiatory, and terminating with the most arduous and severe; the former being such as will not over-task the powers of the weakest and most inexpert, and the latter such as will test and increase those of the most practised; the effort required for the performance of the exercises thus gradually increasing with the advancing capacity of the learner. The entire range constituting the System is performed with apparatus either moveable or fixed; all exercises of mere position or posture have been avoided, except only in so far as they form a preliminary to the exercises with apparatus; for in no way do they furnish adequate exercise to the healthy; they are, in fact, to his great requirements and capacity for physical exertion but a tantalization; moreover, they are quite incompetent to maintain in their practice the pleasure and interest which are essential to the beneficial results of all exercise. And to secure these results in the present System, the exercises are given in such great variety, that while every part of the complex structure of the human body may receive ample and suitable employment, the form of such employment may be varied almost daily.

From the different forms of apparatus or machines are formed the preliminary course of introductory exercises, and the four progressive courses which make up the system, the titles of the courses indicating the general character of the exercises in them, as follows :—

INTRODUCTORY COURSE.	
FIRST COURSE . .	*Simple Exercises.*
SECOND COURSE . .	*Exercises of medium difficulty.*
THIRD COURSE . .	*Advanced Exercises.*
FOURTH COURSE . .	*Arduous Exercises.*

As the greater number of the machines admit of simple, advanced, and arduous exercises, it will be found that each of these courses (save the introductory one) extends over the principal apparatus. Thus the first course (on the fixed apparatus) is formed of the initiatory exercises on each machine, all of a simple and general character ; the second embraces the medium exercises on the same machines, requiring more energetic and dexterous action than the preceding ; the third embraces the advanced exercises on the principal machines, calling for powerful local effort and endurance by repetition ; and the fourth consists of the most arduous exercises on the same machines.

In the case of several machines, appendices have been given, containing exercises, which are in some cases unusually arduous ; in other cases of little or no value to Physical Education in themselves, but which form a pleasing variety to the accomplished gymnast and may safely be performed by him, when he has mastered the four courses of the System. They are designed in some cases to give a 'finish' to exercises already described in one of the courses ; in others to supply variety ; but, almost without exception, they are unsuited to any but the most skilful.

The exercises on each machine are divided into series, the titles of which indicate either the position from which the exercises comprised in it are performed (as standing, running, &c.), or the nature of the movement composing the exercises (as marches, evolutions, combinations, &c.), or in other cases the part of the machine to be employed.

The number of the exercise, and the course to which the exercise belongs, will be found in the margin, opposite the description of each exercise.

With the view of making the work fulfil as completely as possible its object as a guide and reference on all occasions, every separate machine is prefaced by a note exponent of the nature and object of its exercises, the parts of the body which they employ, and the purpose of such employment. In these notes are carefully pointed out the duties of an instructor in every situation, his position with regard to the learner, the peculiar risks, where such exist, to be guarded against in the different exercises, and the errors most likely to be inadvertently committed in their practice, the modes in which the more complicated or difficult exercises may be gradually approached, and the different ways in which the learner may rest for a time on the machine itself, if overcome with fatigue at a distance from the ground; with other information which he may be likely to find of service.

RULES FOR CONDUCTING THE LESSON.

In the preceding note explaining the principles upon which the System is founded, it is shown that each course consists of a selection of exercises, all as nearly as possible of a uniform degree of difficulty, and demanding in their performance an equal amount of muscular effort. By this arrangement the youngest beginner has as wide a range of exercises—as extended a use of the gymnasium, as the most advanced learner; for the limitations of the courses are decided by the degree of difficulty of the exercises themselves, and not by the apparatus on which they are performed; and every machine, with very few exceptions, presents exercises suited to the capacity of learners of every grade of physical power. Each course, and in a great measure each exercise in each course, leads directly to that in advance of it, so that the learner in his first efforts in his first lesson is really practising that which will aid him in mastering the most difficult exercises in the terminating course. This essentially progressive character, this gradual, uniform, onward march of the entire range of exercises from the first to the last, must never be lost sight of by the instructor, but must always be viewed by him as being the fundamental principle of the system, the main source of its value, and the chief guarantee for its safety, while it also constitutes a most powerful agent in sustaining the interest of the learner during his practice.

To give variety to the lesson, each course is made to consist of a much greater number of exercises than can be performed by the learner at any single attendance, so that the instructor is provided with ample scope for selection, by means of which he may vary the lesson almost daily, while still ranging within the prescribed limits of the course.

But there is another form of variety which it is most desirable to secure, and which must be in a great measure intrusted to the intelligence and care of the instructor. As already explained, each article of apparatus in the gymnasium is designed to give special employment to special parts of the body, in accordance with the principle that all muscular power is intermittent, and is most effectively cultivated and sustained by brief and recurring efforts. It will, therefore, be the object of the instructor to secure, by a judicious selection of the various machines during the lesson, a fair share of exertion to the several parts of the body, and to pass his class from machine to machine in such order that each successive one will call into action a new part of the body, and at the same time give rest to those employed by its predecessor.

For example, the class may begin the lesson with exercises such as the running leap, height or distance; or the running vault, right and left, on the vaulting-horse; for these exercises, though chiefly employing the lower limbs, require no great or strictly localized exertion, and they gradually quicken the circulation, supple the joints, and put into light and free play a great number of muscles, and thus prepare the body for more arduous efforts. To these, the frame being now at its greatest pitch of power, supple and as yet unfatigued, may aptly succeed the exercises on the elementary apparatus, such as the bridge ladder, giving strong and concentrated employment to the chest and upper limbs; to this may succeed the parallel bars, fixed or moveable, or the pair of rings, or the trapezium; for these all afford abundant employment to the trunk of the body through the medium of the upper limbs. From this point the exercises may be repeated in character, although in other forms, on different apparatus, chiefly on the vertical machines for climbing; and the lesson may conclude with those of a less arduous nature, where balance and dexterity and facility of movement are the points cultivated, to be executed on various machines, whether horizontal or inclined.

The lesson will always be strictly confined to the exercises of the course, and no advance into a second and higher course will be made until the exercises in the preceding one can be executed with accuracy and precision.

Each class should consist of not less than ten or more than fifteen learners. It is not desirable to preserve a too formal attitude or discipline during the lesson, while at the same time it will be readily perceived that the due observance of certain rules and regulations is necessary, not only for the sake of preserving propriety, and of securing the good government of the gymnasium, but also for the sake of the advantage to be derived from the careful performance of the exercises, and for the safety of the learners during their practice.

Under ordinary circumstances the instructor will set (i. e. perform in its perfect manner) each exercise, followed by the assistant instructor or monitor when one is attached to the class; the learners will then follow in succession in their proper order. Each learner will hold himself ready in his proper time to step up to the machine the instant his predecessor has quitted it, and on the completion of the exercise he will quietly step aside to give place to his successor, previously steadying or re-adjusting the machine when required, and take his place as indicated by the instructor, either by returning to the side of the machine from which he started, to be in readiness to follow in the next exercise, or by remaining on the side where the exercise terminated, as may be most suitable for the effective working of the machine, and for watching the performance of each succeeding learner.

The learners in one class must on no account be allowed to mix with those of another during the lesson ; and the more effectually to sustain this important regulation, the instructor should select those machines, other things being suitable, which are farthest removed from those being worked by other classes.

THE SYSTEM

BY COURSES OF EXERCISES.

INTRODUCTORY COURSE.

FIRST PRACTICE . .	*Movements and Positions.*
SECOND PRACTICE . .	*The Dumb Bells.*
THIRD PRACTICE . .	*The Bar Bells.*

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Walking. p. 55.	To walk at slow time, short distance. To walk at half speed, short distance.	To walk at speed, short distance.	To walk at speed, long distance.	
Running. p. 57.	To run at slow time, short distance. To run at half speed, short distance.	To run at speed, short distance.	To run at speed, long distance.	
Leaping. p. 59.	Standing. To leap height in two movements. To leap height in one movement. To leap height in one movement, the left (or right) side leading. To leap width.	Standing. To leap width, to the rear. To leap width, sideways. To leap depth. To leap depth, to the rear.	Standing. To leap height and width combined. To leap width and depth combined, to the rear. The same. A Second Method.	

Leaping (*continued*).	Running. To leap height in two movements. To leap height in one movement. To leap height in one movement, the left (or right) side leading. To leap width.	Standing. To leap width and depth combined, to the front.	Standing. To leap width and depth combined, sideways. Running. To leap height and width combined.	
Leaping Rope. p. 70.	To leap height. To leap width.	To leap height, hand over hand.	The double swing.	
Leaping Pole. p. 74.	Standing. To leap width.	Standing. To leap height. To leap depth. Running. To leap width. To leap height.		
Horizontal Beam. p. 79.	Sitting. The front march. The rear march. The side march.	Sitting. The front march, hands only. The front march, both hands at once.		

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Simple Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Horizontal Beam (*continued*).	Upright. The front march, the left (or right) foot leading. The front march, right and left. The side march. The rear march, the left (or right) foot leading. The rear march, right and left.	Sitting. The rear march, both hands at once. Upright. To march to the front, one foot on the beam. Changes of Position. To change front. The same. A Second Method. To change position. To rest on the beam.	Changes of Position. To lie extended on the beam. To pass upon the beam (two men meeting). The same. A Second Method. To descend from the beam. To re-ascend the beam.	
Vaulting Bar. p. 93.	To vault the bar in three movements.	To vault the bar in two movements. To vault the bar in one movement.	To vault the bar between the hands. To vault the bar, the legs astride. To vault the bar by the back lift. To vault the bar by the back lift, in two movements.	To vault the bar over one hand. To vault the bar with the hands only. To vault the bar with the hands only, by the back lift. To vault the bar with the hands only, over one hand. To vault the bar with one hand—flank vault. To vault the bar with one hand—front vault. To vault the bar with one hand—rear vault.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Vaulting Horse. p. 102.	Preliminary. To come to the Rest upon the horse. Standing. To vault on the horse in two movements. To vault on the horse in one movement. To vault the horse in two movements. To vault the horse in one movement. To vault on the horse resting on the knees. Running. To vault on the horse. To vault the horse. To vault on the horse resting on the knees.	Standing. To vault on the horse resting on the feet. Running. To vault the horse, the back hollow. To vault on the horse resting on the feet. By the Croup. To vault to the saddle. To vault to the croup resting on the feet. To vault to the croup, the legs on the right.	Standing. To vault the horse between the hands. To vault the horse, the legs astride. To vault the horse by the back lift. To vault on the horse with one hand. Running. To vault the horse between the hands. To vault the horse, the legs astride. To vault the horse by the back lift. By the Croup. To vault the croup, the legs passing from right to left. To vault the horse by the croup, the legs astride. First Method. Do. Second Method. Do. Fourth Method. To vault the horse by the croup through the hands, in two movements.	Standing. To vault the horse by the back lift, the back hollow. To vault the horse by the back lift, resting on the forearm. To vault the horse by the back lift, showing the straight-arm balance. To vault the horse by the back lift, over one hand. To vault the horse by the back lift and turn. To vault the horse with one hand—flank vault. To vault the horse with one hand—front vault. To vault the horse with one hand—rear vault. Running. To vault the horse between the hands, the back hollow. To vault the horse between the hands, showing a balance. To vault the horse, the legs astride, the back hollow. To vault the horse by the back lift, the back hollow. To vault the horse between the hands, by the back lift.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Vaulting Horse (*continued*).	By the Croup. To vault to the croup. To vault to the croup resting on the knees.			Running. To vault the horse by the back lift, resting on the forearm. To vault the horse by the back lift, showing a straight-arm balance. To vault the horse by the back lift, over one hand. To vault the horse by the back lift and turn. To vault the horse with one hand—flank vault. To vault the horse with one hand—front vault. To vault the horse with one hand—rear vault. To vault over the horse with one hand with complete turn. To circle over the horse with both legs.
				By the Croup. To vault the horse by the croup, the legs astride, the back hollow. To vault the horse by the croup, the legs astride. Fifth Method. To vault the horse by the croup, through the hands. To vault the horse by the croup, by the back lift.

		Simple Exercises.	*Medium Exercises.*	*Advanced Exercises.*	*Arduous Exercises.*
Parallel Bars. p. 141.	Preliminary.	To come to the Rest between the bars.		To come to the Rest between the bars by the slow rise.	
	Travelling.	The single march forwards. The single march backwards.	The double march forwards. The double march backwards. The single march forwards, arms bent. The single march backwards, arms bent. The double march forwards, arms bent. The double march backwards, arms bent.	The single march forwards, arms bent, rising to the Rest. The single march backwards, arms bent, rising to the Rest. The single march forwards, the legs up. The single march backwards, the legs up. To circle in the Rest.	The double march forwards, the legs up. The double march backwards, the legs up. To circle in the Rest, arms bent.
	Oscillations.	To clear the bar by the front. To clear the bar by the rear. To rest on the left bar and clear the right, by the front. To rest on the left bar and clear the right, by the rear. To rest on the right bar in front, and clear it by the rear. To rest on both bars in front, and clear the right (or left) by the rear.	To clear the bar by the rear, Second Method. To clear the bar by the rear, the back hollow. To rest on the left bar in the rear, and clear it by the front.	Oscillatory exercises of the First and Second Course with the back hollow. To pass by the rear by the single swing. To rest on the left bar in front, and clear it in the rear by the single swing.	Oscillatory exercises of the Third Course with the back hollow. The straight-arm balance. To rise to the balance. The forearm balance. The forearm balance Second Method. The upper-arm balance. The shoulder balance. Exercises of Third Course combined with straight arm or varied balances. The forward balance. To form the straight line above bars. To form the straight line above bars, resting on the elbows. To form the straight line above bars, resting on one elbow. To circle in the straight line above bars. To circle above bars, the legs up.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Parallel Bars (*continued*).		Oscillations. To rest on both bars in the rear, and clear the right (or left) bar by the front. Combinations. The single march and swing forwards. The single march and swing backwards. The double march and swing forwards. The double march and swing backwards.	Oscillations. To rest on both bars in front, and clear the left (or right) in the rear by the single swing. To rest on the left (or right) bar in the rear by the single swing, and clear the right (or left) by the rear. To rest on both bars in the rear by the single swing, and clear the right by the rear. To rest on the left (or right) bar in the rear by the single swing, and clear it (or the right) by the front. To rest on both bars in the rear by the single swing, and clear the right (or left) bar by the front.	Combinations. The single and double marches in the swing, forwards and backwards, bent arms. The single and double marches in the swing, forwards and backwards, with bending and straightening of the arms during the oscillations to the front and to the rear. The single march and rest, forwards and backwards, the back hollow. The double march and rest, forwards and backwards, the back hollow. The single march and rest forwards, showing the straight line. The double march and rest forwards, showing the straight line. The single and double marches, forwards and backwards, showing the straight line after balance. The single and double marches, forwards and backwards, showing a straight line previously to balance. The forward roll. Forward rolls from the straight arm and varied balances. The backward roll. The roll from the seat astride the bars. The roll on one bar.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Parallel Bars (*continued*).			Combinations. The single march and swing forwards, advancing with each rear oscillation. The single march and swing backwards, advancing with each front oscillation. The double march and swing forwards, advancing with each rear oscillation. The double march and swing backwards, advancing with each front oscillation. The single march and rest, forwards. The single march and rest, backwards. The double march and rest, forwards. The double march and rest, backwards.	Combinations. To march above the bars, forwards. To march above the bars, backwards. To march above the bars, forwards and backwards, the arms bent. The double march above the bars, forwards. The double march above the bars, backwards. The double march above the bars, forwards and backwards, the arms bent. The alternate march above bars resting on the shoulders, forwards. The alternate march above bars resting on the shoulders, backwards. The circular march above the bars. The march above the bars, the legs astride, forwards. The march above the bars the legs astride, backwards. The double march above the bars, the legs astride, forwards. The double march above the bars, the legs astride, backwards.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Moveable Parallel Bars. p. 197.	Over the bars. To clear the bars, resting on the first. To clear the bars, resting on the second. Under the bars. To pass from the first to the second bar, the right (or left) hand leading. Between the bars. To rise between the bars, the legs resting on the single bar. To rise between the bars, the legs resting on the two bars.	Over the bars. To clear the bars in one movement To clear the first bar by the rear and the second by the front. To clear both bars separately by the rear. Under the bars. To pass from the first to the second bar, changing front. To pass from the first to the second bar, both hands at once. Between the bars. To rise between the bars by the forearms.	Over the bars. Exercises of the Second Course, the back hollow. Under the bars. To pass from the first to the second bar, both hands at once, changing front. Between the bars. To rise between the bars, both hands at once. To rise by the first bar and descend by the second.	Between the bars. To rise between the bars by the upstart. To rise between the bars by the upper arm upstart. To rise between the bars by the upper arms, by the forward swing. To rise between the bars by the upper arms, by the backward swing.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Trapezium. p. 211.	By the ropes. To rise by the single rope. To rise by both ropes. To rise by the bar and rope.	By the ropes. To rise by the bar and rope by the front lift. To turn round the ropes, right and left.	By the bar. To turn round the bar forwards. To turn round the bar backwards. To turn round the bar backwards and return. To rise above the bar, right and left.	By the bar. To rise above the bar, both hands at once. To turn under the bar on one hand. To form the straight line backwards. To form the straight line forwards. Combinations.
Pair of Rings. p. 227.	Beneath the rings. The single circle.	Beneath the rings. The double circle. To turn with the feet in the rings. To extend the arms right and left.	Beneath the rings. To turn on one hand, right and left. Rising between the rings. To rise above the rings, right and left.	Beneath the rings. The single circle, the back hollow. The double circle, the back hollow. To form the straight line backwards. To form the straight line forwards. To form the straight line on one arm. Rising between the rings. To rise above the rings, both hands at once. To rise above the rings backwards, right and left. To rise above the rings backwards, both hands at once. To rise above the rings by the forward circle. Do. the back hollow. To rise above the rings by the foot and hand. Above the rings. To extend the arms above the rings, right and left. To form the straight line above the rings. Do. the back hollow throughout. The front roll between the rings.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Pair of Rings (*continued*).				Above the rings. To extend both arms at once above the rings. To stand above the rings. To stand above the rings, the arms straight. Do. the back hollow throughout. To extend the arm in the stand above the rings. Combinations.
Row of Rings. p. 247.		The swing.		The circle in the swing. The rise above the rings in the swing.
Elastic Ladder. p. 251.		The single step.		The double step.
Horizontal Bar. p. 254.	Below the bar. The single circle.	Below the bar. The double circle.	Below the bar. To swing to the front.	Below the bar. To turn under the bar on one hand. To form the straight line backwards. To form the straight line forwards. To form the straight line on one arm, sideways.
	Rising to the bar. To rise to the bar (three times). To rise to the bar, the hands reversed (three times).	Rising to and above the bar. To rise to the bar (six times). To rise to the bar, the hands reversed (six times).	Rising to and above the bar. To rise to the bar (nine times). To rise to the bar, the hands reversed (nine times). To rise above the bar in the swing, with one leg acting.	Rising to and above the bar. To rise to the bar (as often as possible). To rise to the bar, the hands reversed (as often as possible). To rise above the bar in the swing, both legs at once.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Horizontal Bar (*continued*).		Rising to and above the bar. To rise above the bar by the fore-arms, right and left. To rise above the bar by the fore-arms, both hands at once. To rise above the bar, the right (or left) leg acting.	Rising to and above the bar. To rise above the bar, right and left. To swing to the front from the Rest. To shoot to the front from the Rest. The front vault over the bar in two movements. Circling round the bar. To turn round the bar. To turn round the bar, the hands reversed. To turn round the bar backwards.	Rising to and above the bar. To rise above the bar, both hands at once. To rise above the bar backwards, right and left. To rise above the bar backwards, both hands at once. To rise above the bar, by the upstart. To rise above the bar, both hands at once, by the uprise. To drop back from the Rest. To throw out from the Rest. To form the straight line above bar. To form the straight line above bar, resting on the elbows. The short arm balance. The straight arm balance. The front vault over the bar. Circling round the bar. The front roll. The short circle. The clear circle. The grand circle. The grand circle backwards. Combinations.
Double Horizontal Bar. p. 291.			To pass from the first to the second bar. To pass from the first to the second bar, changing front.	

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Iron Horizontal Bar. p. 293.	Travelling below the bar. Right (or left) hand leading. Right (or left) hand leading, sideways. Right (or left) hand leading, sideways (legs bent).	Travelling below the bar. Right and left. Right and left, backwards. Right (or left) hand leading, arms bent. Both hands at once, arms bent. Hand over hand, sideways. Hand over hand, sideways (legs bent).	Travelling below the bar. Both hands at once, sideways. Both hands at once, sideways (legs bent). Right (or left) hand leading, sideways (legs up). Hand over hand, sideways (legs up). Both hands at once, sideways (legs up). Travelling above the bar. Right (or left) hand leading.	Travelling above the bar. Right (or left) hand leading, the arms bent. Right (or left) hand leading, backwards. Right (or left) hand leading, backwards, the arms bent. The circular march. Right (or left) hand leading, legs astride. Hand over hand, legs astride. Both hands at once, legs astride. In the straight line.
Bridge Ladder. p. 305.	By the sides. Right (or left) hand leading backwards. Right and left backwards. Right (or left) hand leading forwards. Right and left forwards.	By the sides. Both hands at once backwards. Both hands at once forwards.	By the spars. Right (or left) hand leading, backwards. Right and left backwards. Right (or left) hand leading, forwards.	By the sides. Right (or left) hand leading, sideways. Hand over hand, sideways. Both hands at once, sideways. By the spars. Both hands at once, backwards. Both hands at once, forwards. Both hands at once, sideways. Legs up. Right and left, backwards (by the spars). Both hands at once, backwards (by the spars).

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Bridge Ladder (*continued*).			By the spars.: Right and left, forwards. Right (or left) hand leading, sideways. Legs up.: Right (or left) hand leading, backwards (by the spars). Right (or left) hand leading, forwards (by the spars). Right (or left) hand leading, sideways (by the spars). Right (or left) hand leading, sideways (by the sides).	Legs up.: Right and left, forwards (by the spars). Both hands at once, forwards (by the spars). Both hands at once, sideways (by the spars). Hand over hand, sideways (by the sides). Both hands at once, sideways (by the sides).
Plank. p. 318.	With hands and feet.: Right (or left) hand leading. Right (or left) side leading. Right and left side. Right and left, hand and foot.	Hands and feet.: Both hands at once. Hands and knees.: Right (or left) hand leading. Right (or left) side leading. Right and left side. Right and left, hand and knee.	Hands and knees.: Both hands at once. Hands only.: Right (or left) hand leading. Right and left.	Legs suspended.: Both hands at once. Hands only.: Both hands at once.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Ladder Plank. p. 327.	With hands and feet. Right (or left) hand leading. Right (or left) side leading. Right and left side. Right and left, hand and foot. Both hands at once. Backwards. By the spars.	Hands only. Right (or left) hand leading. Backwards. By the centre.	Hands only. Right and left.	Hands only. Both hands at once.
Inclined Ladder. p. 335.	Above the ladder. Right (or left) hand leading. Right (or left) side leading. Right and left side. Right and left, hand and foot. Both hands at once. With one hand. Under the ladder. Right (or left) hand leading (by the spars). Right (or left) side leading (by the spars).	Under the ladder. Both hands at once (by the spars). Right (or left) hand leading (by the sides). Right (or left) side leading (by the sides). Right and left side (by the sides). Right and left, hand and foot (by the sides). Both hands at once (by the sides). Right (or left) hand leading (spars and sides).	Above the ladder. With the feet only. Under the ladder. Both hands at once (by spars and sides). Hands only. Right (or left) hand leading (by the sides). Hand over hand (by the sides). Right (or left) hand leading (by the spars). Hand over hand (by the spars).	Hands only. Both hands at once (by the sides). Both hands at once (by the spars). Both hands at once (spars and sides). Hand over hand, sideways. Hand over hand, sideways (legs up). Right (or left) hand leading (above the ladder). Hand over hand (above the ladder).

Inclined Ladder (*continued*).	Under the ladder. Right and left side (by the spars). Right and left, hand and foot (by the spars).	Under the ladder. Right (or left) side leading (spars and sides). Right and left side (spars and sides). Right and left hand and foot (spars and sides).	Hands only. Right (or left) hand leading (spars and sides). Hand over hand (spars and sides). Right (or left) hand leading, sideways. Right (or left) hand leading, sideways (legs up).	
Prepared Wall. p. 355.	With hands and feet. Right (or left) hand leading. Right (or left) side leading. Right and left side. Right and left hand and foot.	With hands and feet. Both hands at once.	With hands and feet. With one hand. With hands only. Right (or left) hand leading.	With hands only. Right and left. Both hands at once.
Vertical Pole. p. 365.	With hands and feet. Right (or left) hand leading. Hand over hand. The same. A Second Method.	With hands and feet. Both hands at once.	With hands and feet. With one hand. With hands only. Right (or left) hand leading. Hand over hand.	With hands only. Both hands at once.

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Fixed Vertical Pole. p. 375.			Hands and feet. {Right (or left) hand leading. Right side leading. Right and left side. Right and left, hand and foot. Hands and knees. {Right (or left) hand leading. Right (or left) side leading.	Hands and knees. {Right and left side. Right and left, hand and knee. Both hands at once.
Slanting Pole. p. 380.	Under the pole. {Right (or left) hand leading. Hand over hand.	Under the pole. {Both hands at once.	Under the pole. {With one hand.	Hands only. {Both hands at once.
	Above the pole. {Right (or left) hand leading. Hand over hand.	Above the pole. {Both hands at once.	Hands only. {Right (or left) hand leading. Hand over hand.	

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Turning Pole. p. 388.	The pole held firm. Right (or left) hand leading.	The pole held firm. Hand over hand. Both hands at once. The pole turning. Right (or left) hand leading. Hand over hand.	The pole turning. Both hands at once.	The pole turning Turning with the pole.
Pair of Vertical Poles. p. 393.		Upright. Right (or left) hand leading. The legs up. Right (or left) hand leading.	Upright. Hand over hand. Both hands at once. The legs up. Hand over hand.	Hands reversed. Right (or left) hand leading. Hand over hand. Both hands at once. The legs up. Both hands at once.
Pair of Slanting Poles. p. 399.	Right (or left) hand leading. Right (or left) side leading.	Right and left side.	Right and left hand and foot. Both hands at once.	

MACHINE.	FIRST COURSE. *Simple Exercises.*	SECOND COURSE. *Medium Exercises.*	THIRD COURSE. *Advanced Exercises.*	FOURTH COURSE. *Arduous Exercises.*
Vertical Rope. p. 403.	With hands and feet. Right (or left) hand leading. (The foot in the half turn.) The same. (The foot in the full turn.) The same. (The foot in the stirrup loop.)	With hands and feet. Hand over hand. The same. (A Second Method.) Both hands at once.	Hands and feet. With one hand. Hands only. The right (or left) hand leading. Hand over hand. The legs up. Right hand leading. Hand over hand.	
Rosary. p. 413.	The simple climb.			
Mast. p. 416.			Hands and feet. Hand over hand. The hands overlapped. The hands interlaced.	Hands and feet. **To walk the mast.** **The hands only.**

TECHNICAL TERMS.

The following are the technical terms which are necessary to the practice of Gymnastics upon Apparatus. In cases where an exercise is *uniformly* known by a given title, this title will be found beneath the description of the exercise.

The Position is the attitude of 'attention' assumed previous to the exercise, and reassumed on its completion.

The Step is the action, simple or compound, of which certain exercises, as climbing, are composed; every action throughout such exercises being but a repetition of the first step.

The Reach is the point to which the hand is raised on the full upward extension of the arm.

The Half-Reach is the point, opposite the face, to which the hand is raised when the forearm is bent nearly at a right angle with the upper arm.

The Distance is the space between the hands when they are placed at the width of the shoulders, as in vaulting.

The Space is the distance between any two regularly recurring points of a machine, as the rounds of a ladder.

The Leading hand, foot, or side, is the one which takes the lead in any exercise.

The Supporting hand, foot, or side, *follows* the leading one.

The Ordinary Grasp of the hand is when the palm is turned outwards, away from the face.

The Reversed Grasp of the hand is when the palm is turned inwards, towards the face.

The Combined Grasp of the hands is when the one hand employs the ordinary grasp, the other the reversed grasp.

The thumbs and fingers are said to be *together* when in grasping an object the thumb and forefinger do not separate; they are said to be *meeting* when they partly or wholly encircle an object and meet, or nearly so, from opposite sides.

The Rest. The body is said to be at the *Rest* when it is supported entirely upon the hands, the arms straight, the legs together, the toes pointed downwards.

Similarly the body is said to be at the *Back Rest*, *Forearm Rest*, &c. &c., accordingly as it is supported on the hands backwards to the machine, on the forearm, &c. &c.

A vault is called a *Flank* Vault, *Front* Vault, or *Rear* Vault accordingly as the side, the front, or rear of the body are towards the machine when the exercise is performed.

The Balance in gymnastics is more commonly used to denote the position, when the body is supported perpendicularly above the head upon the hands, the legs together, the toes pointed upwards.

Thus the body is said to be in the *Short Arm* Balance, the *Straight Arm* Balance, the *Forearm* Balance, &c. &c., accordingly as the body is supported upon the hands with the arms bent or straight, or upon the forearms, &c. &c.

The Lift (e. g. Back Lift) is where the body is lifted by means of the hands up to or over the machine, when the machine is on a level with or higher than the hands.

The Hand Spring is where the body is made to turn over upon the hands, the machine being below the level of the hands.

urns. The body is said to make a *quarter turn* to the right or left, when it faces right or left from the front.

t is said to make a *half turn* right or left when it faces right about or left about from the front.

t is said to make a *complete turn* right or left when it turns wholly round by the right or left to the front again.

ircles are of two kinds, accordingly as they are *above* or *round* the apparatus.

ircles *above* apparatus (e. g. the Vaulting Horse and Parallel Bars) consist (1) of *pivots* on the hands with legs and body in position ; (2) of circular movements of the legs, the hands being raised for them to pass. The latter are usually termed *Leg Circles.*

ircles *round* apparatus (e. g. the Vaulting Bar) imply complete encircling of the machine, and are subdivided into *hand circles, hock circles, feet circles,* &c. &c., accordingly as the hands, hocks or feet rest upon the machine during the circle.

Feint is the term applied exclusively to vaulting exercises, implying a halt in the middle of the exercise and the performance of some other exercise from the momentary position. Feints are termed *right feints,* or *left feints* accordingly as they are performed with the right or left leg leading, and *single feints,* or *double feints,* accordingly as they are performed with one leg or both.

INTRODUCTORY COURSE.

MOVEMENTS AND POSITIONS—MOVEABLE APPARATUS.

Mere movements and positions are, in themselves, only of comparative utility; indeed, they are chiefly valuable in as far as they faithfully represent the movements and positions of Exercises yet to be learned under more difficult conditions. Thus the movements and positions preparatory to the sword exercise, as practised in the British army, may be instanced as most valuable; yet not so much from their intrinsic merits as because they form the fundamental positions and actual movements of the various stages of the exercise afterwards to be acquired, when the difficulty will be increased by the wielding of the weapon itself.

This principle should govern and limit all exercises of mere movement and position; they should in every instance and in all respects lead direct to a higher course of instruction; for otherwise they cease to be real, and, if divested of their reality, it is found that, at any rate with Englishmen, the earnestness of application cannot be sustained in their practice.

On this principle the introductory course of this System is based, the design being to organize a short and simple course which should give fair and uniform employment to every part of the body, and be capable of modification to suit the strength of every learner; which should possess the reality and attractiveness of gymnastics proper, on fixed apparatus, and which, like them, should admit of regular and definite advancement.

There are several forms of apparatus, which, to a certain extent, provide for these requirements. The Indian clubs can be augmented in weight, and thus a progressive effort be secured; but a small number of men only can use them at the same time, and the range of exercises which they present is limited, and these are in themselves not of the highest order, acting almost exclusively on the upper region of the body; they have also the serious drawback that if unskilfully used, and if the rearward action of the club in some of the exercises be not steadily resisted, this portion of the body will be abnormally developed by their practice; the base of the breast-bone with the lower ribs will become unduly prominent, the upper part of the chest proportionately flattened, and the back, between the shoulders, undesirably hollow.

A course of exercises of considerable value, similar to those executed with the stick, may be performed with an iron bar, but they have the important drawback of being invariably viewed as a task, disliked by weak and strong.

A third form of exercise, now much in vogue, is obtainable from an arrangement of suspended weights, which are to be raised by the flexions and extensions of the upper limbs or lower limbs, according to the wishes of the performer. Such exercises are valuable in an elementary sense, and are in every way superior to either of the foregoing; but they have their attendant drawbacks, viz. considerable expense for apparatus, limited capabilities for class practice, and want of attractiveness in the exercises themselves.

The form of machine which has been selected for this course appears at once to fulfil all the objects desired, and to avoid all the points that seem objectionable in others.

1st. The dumb bell is familiar to every one, and has been used in this country for centuries[1].

2nd. It can be adjusted to the advancing capacity of the learner, the weight of the bar and bell being augmented as his strength increases. Its exercise is thus real and effective. The light wooden dumb bells so much in use are only of value in assisting the movements of free exercises, and are unsuited for progressive work.

3rd. Its exercises give fair employment to all parts of the body, and to both sides equally.

4th. They are capable of being executed not only by an entire class at one time, and by the same word of command, but by many classes, or by the entire number of men which may at one time be present in the gymnasium.

5th. The positions and movements are of the highest order, and are directly and powerfully conducive to erectness of carriage and freedom of limb.

Mention has been made of the excellence of the positions of the sword-exercise; the same positions constitute the fundamental ones of fencing, and two of the same (the first and third) have been selected to form the principal positions of the exercises of this course, the bell and bar being substituted for the sword or foil.

The course is divided into three parts; the first consists simply of the *movements and positions* of the second and third practices; the object in thus giving them separately being to prepare the learners for the others, for in these exercises accuracy of position is essential not only to their value, but to safety.

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[1] John Northbroke, in a treatise written in the time of Queen Elizabeth, advises young men, by way of amusement, to 'labor with poises of lead or other metal;' this notable pastime, I apprehend, bore some resemblance to the skiomachia, or fighting with a man's own shadow, mentioned in one of the *Spectators*. 'It consisted,' says the author, 'in brandishing two sticks, grasped in each hand, and loaden with plugs of lead at either end; this pastime opens the chest, exercises the limbs, and gives a man all the pleasure of boxing without the blows.' It is sometimes practised in the present day, and called 'ringing of the dumb bells.'—Strutt's *Sports and Pastimes of the People of England*.

The second practice, *with the bells*, takes up the movements and positions of the first practice; it is given in one unbroken series, although it will be seen that the first four are all simple exercises, that in the fifth a complete change in the action and position takes place, and that the succeeding ones consist of repetitions of the simple ones, rising in difficulty to the closing exercise of the practice.

The third practice, *with the bars*[1], reproduces also the movements of the first practice; and, as in the second practice, a change of action and position takes place after the simple exercises, those which follow consisting of movements in repetition, also rising in difficulty to the closing exercises of the practice.

The first practice need not be repeated after the learner has entered upon the second and third, but these last may, with great advantage, form a part of every subsequent course, and it is an excellent custom to close each day's lesson on the fixed apparatus with one or other of them, thus uniting in a final exercise all the learners at that time working in the gymnasium.

The position of the instructor should be opposite the centre, facing the class. Better time will be kept, and the spirit of the practice will be better sustained, if the instructor executes every movement himself while giving the word of command.

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[1] This is a two-handed dumb-bell. It is a French adaptation of considerable value, as are also its special exercises.

FIRST PRACTICE.

Movements and positions.

WORD OF COMMAND.	ACTION AND POSITION.
Attention	Position of attention, the toes at the target (Fig. 1).
Step to the rear . .	Make a full step to the rear with the left foot, the right following.
Step to the front . .	Resume the first position at the target.
Step to the rear . .	As before.
Left foot forward .	1. Move the hands to the rear, the left grasping the right arm just above the elbow, and the right supporting the left arm under the elbow (Fig. 2). 2. Make a half face to the right, by turning on the heels, so that the back of the left heel touches the inside of the right, and the left foot is pointed straight to the front (Fig. 3).

Fig. 1.

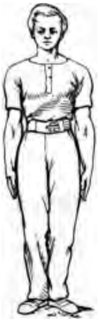


Fig. 2.

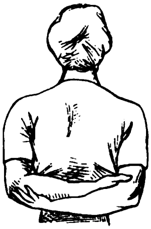
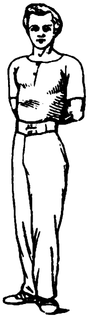
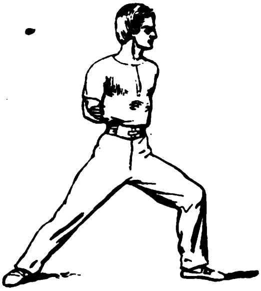
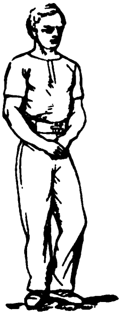


Fig. 3.



RD OF COMMAND.	ACTION AND POSITION.
	3. Make a full step to the front with the left foot, the right remaining firm and flat on the ground, the knee well braced back, the hips pressed forward, the head upright, the breast advanced, the shoulders flat, the eyes directed to the front (Fig. 4). Fig. 4. 
over	Bring the left foot back to the right.
ht foot forward .	1. Face to the left, the right foot pointed straight to the front.
	2. Step out with the right foot, as with the left foot forward.
:over	Bring the right foot back to the left.
p to the front . .	1. Make a half face to the right, and bring the hands down by the sides to the full extension of the arms.
	2. Step to the front, resuming the first position at the target.

WORD OF COMMAND.	ACTION AND POSITION.
Stand at ease . . .	Draw back the right foot 6 inches, placing the hollow of it against the left heel, bringing the weight of the body upon the right leg, the left knee a little bent; bring the hands together in front of the body, striking the palms smartly together, and slipping that of the right hand over the back of the left; the breast advanced, the eyes directed to the front (Fig. 5). Fig. 5. 
Attention	Position of attention, the toes at the target.
Astride	Place the left foot 10 inches on the left of the target, the toes pointed to the front and slightly turned outwards, the right following at the same distance on the right, the knees slightly bent, the arms hanging straight by the sides (Fig. 6).
Ready	Bend the knees until they jut over the toes, keeping the heels on the ground; at the same time stoop from the waist and bring both hands to the centre of the target, the hands closed

D of Command.	Action and Position.
	and together, the thumbs together, the knuckles to the ground (Fig. 7).
. . . .	Straighten the back and lower limbs; at the same time bring the hands close up by the sides, and carry them to the full extension of the arms above the shoulders (Fig. 8). This exercise to be repeated six times, the learner counting the numbers, and the instructor giving the time and pitch of voice by the word 'down' at each descent. The word to be given and the numbers to be counted in a clear and full tone, the sound to be prolonged over the time occupied in the ascent from the waist to the full extension of the arm[1].

ig. 6.

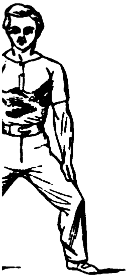


Fig. 7.

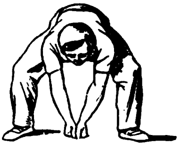
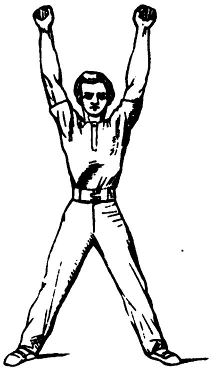


Fig. 8.



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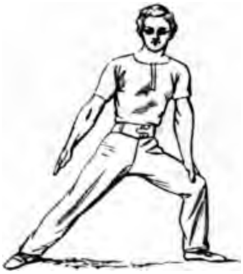
his exercise may be varied by retaining the knees bent, as in 6, during the elevation of the bells.

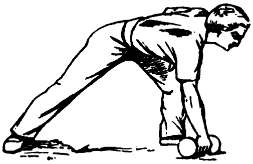
WORD OF COMMAND.	ACTION AND POSITION.
Halt	Lower the hands to the sides, and come to the position of attention behind the target.
Step to the rear . .	As before.
Step to the right . .	Make a full step to the right front (at the angle at which the toes are pointed from the position of attention), the left following.
Step to the left . .	1. Make a half face to the left. 2. Make a full step to the left with the left foot, the right remaining flat and firm on the ground, the knee braced back, and at the instant that the foot meets the ground let the left hand grasp the Fig. 9.  thigh just above the knee, the thumb inside, the fingers outside, the lower part of the leg and left arm forming a straight and continuous line from foot

rd of Command.	Action and Position.
	to shoulder, the right arm remaining extended in the line of the right leg (Fig. 9).
to the right . .	Turn on the heels, facing to the right, reversing the position of both lower and upper limbs.
ntion	Come to the position of attention, the toes at the target.
d at ease . . .	As before.

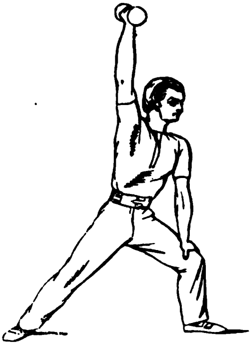
SECOND PRACTICE.

The dumb-bells.

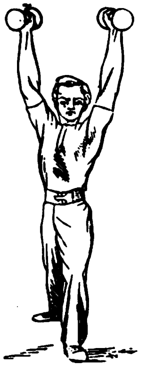
EXERCISE. No. I.

Word of Command.	Action and Position.
Attention	As in first practice, the bells together on the target, the toes at the bells.
Step to the rear . .	As in first practice.
Left foot forward .	Make a half face to the right and step to the front with the left foot as in first practice, the left hand grasping the thigh just above the knee, as the foot comes to the ground, the right arm extended in the line of the right leg. Fig. 10. 
Right hand . . .	Seize the bell with the right hand, the lower limbs remaining in position (Fig. 10).
Up	Raise the bell above the shoulder (bending the arm during the ascent) to the full extension of the arm, leaning strongly on the left knee and pressing

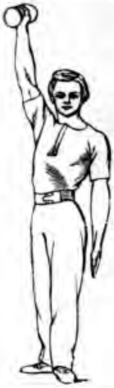
EXERCISE. No. I (continued).

WORD OF COMMAND.	ACTION AND POSITION.
	the breast to the front during the ascent of the bell; in this position the left leg to the knee, and the left arm should form one continuous line from foot to shoulder (Fig. 11). Fig. 11. 
Down	Lower the bell, replace it on the target, and recover, as in first practice.
Right foot forward .	As in first practice.
Left hand	Seize the bell with the left hand, the lower limbs remaining in position.
Up	As with the right hand.
Down	As with the right hand.

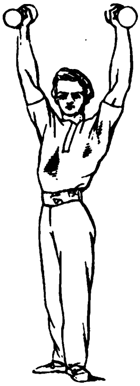
EXERCISE. No. II.

Word of Command.	Action and Position.
Left foot forward.	As before.
Both hands.	Seize a bell in each hand, the arms passing on either side of the knee, the right on the right, the left on the left side.
Up	Raise the bells above the shoulders (bending the arms during the ascent) to the full extension of the arms, keeping the left knee bent, and pressing the breast to the front during the ascent of the bells (Fig. 12).  Fig. 12.
Down	Bring the bells straight down by the sides, replace them on the target, and recover.
Right foot forward	As before.
Both hands	As before.
Up	As before.
Down	As before.

EXERCISE. No. III.

WORD OF COMMAND.	ACTION AND POSITION.
Left foot forward .	As before.
Recovering. Right hand.	Seize the bell with the right hand.
Up	Recover, and at the same time elevate the bell above the shoulder to the full extension of the arm (Fig. 13). Fig. 13. 
Left foot forward .	Step to the front with the left foot, retaining the bell at the elevation above the shoulder, and pressing the breast to the front.
Down	As before.
Right foot forward .	As before.
Recovering. Left hand.	Seize the bell with the left hand.
Up	As with the right hand.
Right foot forward .	As with the left foot forward.
Down	As before.

EXERCISE. No. IV.

WORD OF COMMAND.	ACTION AND POSITION.
Left foot forward.	As before.
Recovering. Both hands.	Seize the bells as in second exercise.
Up	Recover, and at the same time raise both bells above the shoulders to the full extension of the arms (Fig. 14). Fig. 14. 
Left foot forward	As before, retaining the bells at the elevation.
Down	As before.
Right foot forward	As before.
Recovering. Both hands.	As before.
Up	As with the left foot forward.
Right foot forward	As with the left foot forward.
Down	As before.

EXERCISE. No. V.

D of Command.	Action and Position.
to the front . .	As in first practice.
de	As in first practice (Fig. 15).
nd down. (*Six es.*) *Ready.*	As in first practice stoop from the waist, and seize the bells, one in each hand (Fig. 16).
. . . .	The action and position of the ascent as in first practice, carrying the bells above the shoulders (Fig. 17).
n	Lower the bells, letting them swing to the rear between the legs, the instructor giving the word 'down,' the learners counting the numbers, as directed in first practice.
. . . . .	Replace the bells on the target, and resume the position of attention.
to the rear . .	As before.

Fig. 15.

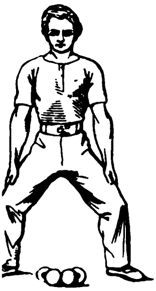


Fig. 16.

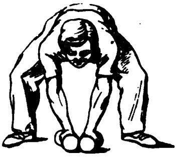
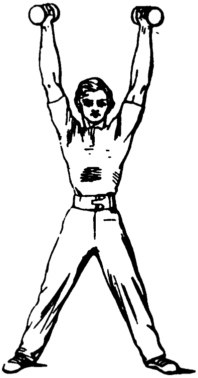


Fig. 17.



EXERCISE. No. VI.

WORD OF COMMAND.	ACTION AND POSITION.
Left foot forward .	As before.
Right hand. (Six times.) Ready.	Seize the bell with the right hand, as in first exercise.
Up	Repeat the first exercise six times, the instructor giving the word 'down,' the learners counting the numbers, as directed in first practice.
Halt	Replace the bell on the target and recover.
Right foot forward .	As before.
Left hand. (Six times.) Ready.	Seize the bell with the left hand.
Up	As with the left foot forward.
Halt	As with the left foot forward.

EXERCISE. No. VII.

Left foot forward .	As before.
Both hands. (Six times.) Ready.	Seize the bells, one in each hand, as in second exercise.
Up	Repeat the second exercise six times, the instructor giving the word 'down,' the learners counting the numbers.
Halt	Replace the bells on the target and recover.
Right foot forward .	As before.
Both hands. (Six times.) Ready.	As before.
Up	As with the left foot forward.
Halt	As before.

EXERCISE. No. VIII.

Word of Command.	Action and Position.
Left foot forward .	As before.
Recovering. (*Six times.*) *Right hand.*	Seize the bell with the right hand.
Up	Repeat the third exercise six times, recovering at each elevation of the bell, the instructor giving the word 'down,' the learners counting the numbers.
Halt	Replace the bell on the target and recover.
Right foot forward .	As before.
Recovering. Left hand	Seize the bell with the left hand.
Up	As with the left foot forward.
Halt	As before.

EXERCISE. No. IX.

Left foot forward .	As before.
Recovering. (*Six times.*) *Both hands.*	Seize the bells as in fourth exercise.
Up	Repeat the fourth exercise six times, recovering at each elevation of the bells, the instructor giving the word 'down,' the learners counting the numbers.
Halt	As before.
Right foot forward .	As before.
Recovering. (*Six times.*) *Both hands.*	Seize the bells as with the left foot forward.
Up	As with the left foot forward.
Halt.	As before.
Step to the front . .	As before.
Places	Stoop from the waist and seize the bells, and place them in the racks.

EXERCISE. No. III.

WORD OF COMMAND.	ACTION AND POSITION.
Step to the right . .	Make a half face to the right, and step to the right as in first practice, bringing the toes of the right foot just within the bell, the left following, the heels touching each other.
Step to the left . .	As in first practice.
Ready	Seize the bar at the centre with the right hand (Fig. 21).
Up	Raise the bar above the head and hold it in a horizontal line at the full extension of the arm (Fig. 22).
Down	Lower the bar with the arm bent, and replace it on the ground, and replace the right arm in position, extended in the line of the right leg.

Fig. 21.

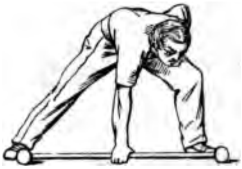
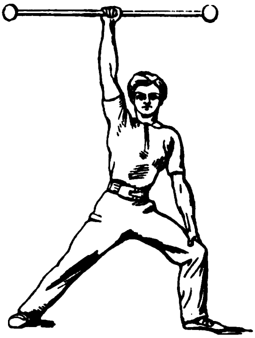


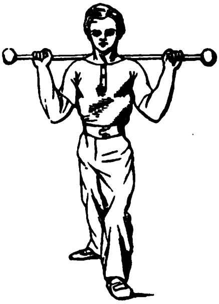
Fig. 22.



EXERCISE. No. III (continued).

ORD OF COMMAND.	ACTION AND POSITION.
ce to the right . .	As in first practice.
ady	Seize the bar at the centre with the left hand.
. . . .	As with the right hand.
wn	As with the right hand, and come to the position of attention at the target.
p to the rear . .	As before.

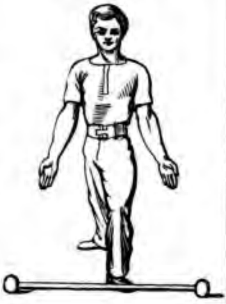
EXERCISE. No. IV.

ft foot forward .	As before.
ady	Seize the bar as in first exercise.
. . . .	As in first exercise.
the shoulders. Six times.)	Lower the bar by the rear until it descends upon the shoulders, pressing the breast to the front, and leaning strongly on the left knee (Fig. 23). Fig. 23. 
. . . .	Elevate the bar to the extension of the arms; the instructor giving the word 'up,' the learners counting the numbers.

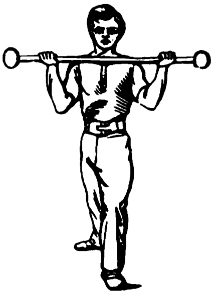
EXERCISE. No. IV (continued).

WORD OF COMMAND.	ACTION AND POSITION.
Down	Lower the bar by the front at the full extension of the arms, replace it on the ground, and recover.
Right foot forward .	As before.
Ready	As with the left foot forward.
Up	As in first exercise.
On the shoulders. (*Six times.*)	As with the left foot forward.
Up	As with the left foot forward.
Down	As before.

EXERCISE. No. V.

Left foot forward .	As before.
Hands reversed . .	Extend the arms to the front, turning the palms of the hands upwards (Fig. 24). Fig. 24. 
Ready	Seize the bar at the distance, the palms of the hands under the bar.
Up	Raise the bar above and slightly in front of the head, to the full extension of the arms.

EXERCISE. No. V (continued).

WORD OF COMMAND.	ACTION AND POSITION.
On the breast. (*Six times.*)	Lower the bar by the front until it descends upon the breast, pressing the breast to the front, and leaning strongly on the left knee, the head slightly held back, the eyes directed to the front (Fig. 25). Fig. 25. 
Up	Elevate the bar to the extension of the arms; the instructor giving the word 'up,' the learners counting the numbers.
Down	As in fourth exercise.
Right foot forward .	As before.
Hands reversed . .	As before.
Ready	As with the left foot forward.
Up	As with the left foot forward.
On the breast. (*Six times.*) *Up.*	As with the left foot forward.
Down	As before.

EXERCISE. No. VI.

WORD OF COMMAND.	ACTION AND POSITION.
Left foot forward .	As before.
Up and down. (*Six times.*) *Ready.*	Seize the bar as in first exercise.
Up	Repeat the first exercise six times, the instructor giving the word 'down,' the learners counting the numbers.
Halt	Replace the bar on the ground, and recover.
Right foot forward .	As before.
Up and down. (*Six times.*) *Ready.*	As with the left foot forward.
Up	As with the left foot forward.
Halt	As before.

EXERCISE. No. VII.

WORD OF COMMAND.	ACTION AND POSITION.
Left foot forward .	As before.
Recovering. (*Six times.*) *Ready.*	As in first exercise.
Up	Repeat the second exercise six times, the instructor giving the word 'down,' the learners counting the numbers.
Halt	Replace the bar on the ground, and recover.
Right foot forward .	As before.
Recovering. (*Six times.*) *Ready.*	As with the left foot forward.
Up	As with the left foot forward.
Halt	As before.
Step to the front . .	As before.
Places	Stoop from the waist and seize the bar, and place it in the racks.

WALKING.

Walking comes the first in order among the exercises of progression[1], which comprise walking, running, leaping; and these again are varied when executed on, or by the assistance of, apparatus, as walking on the beam, leaping—with or without run—over a barrier, with the assistance of rope or pole, or by the aid of the barrier itself as in vaulting. These exercises of progression are for the purpose of giving accuracy and precision to the movements of the body, rather than of endowing it with great muscular strength; and have for their object the enabling it to preserve its equilibrium under special difficulties of position, and to pass with ease and rapidity from one locality to another, rather than to overcome great resistance.

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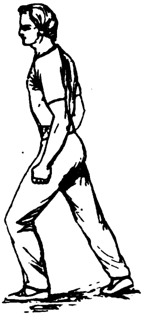
[1] A clear distinction must, at the outset, be drawn between walking and marching, as taught in military drill. The latter must ever be regarded as a military exercise, in which the soldier, for professional considerations, is taught to preserve an attitude more or less formal and constrained; the former has but one object, viz. facility of progression, and every point of position and action is made subservient to this end. Military drill, however, from the very circumstance of its being an exercise in which the action and position of the different parts of the body, during locomotion, are systematized and prearranged, is most valuable to the young and growing, and should be regularly taught in schools. It is admitted that, as a rule, boys dislike drill, but this I am sure is in a great measure owing to the monotonous manner in which it is taught, and the want of tact and discrimination frequently shown by the instructor. Boys, and especially little boys, usually have it not only too frequently and too much of it at a time, but they are kept at the commencement too long. at the least attractive, although very important, parts of it; i. e. *the balance steps, facings*, and *slow time*. I find it is better to pass over these quickly, and to take up the more palatable *quick step, stepping short, stepping out, forming fours*, &c.; and at short intervals to return to pick up a little of what was prematurely passed. The drill never exceeds half an hour, once or twice a week, and in fine weather only.

Slow time—short distance.

EXERCISE 1.
COURSE 1.

Advance the left foot a free step, at the same time incline the column of the body to the front; the head, neck, trunk, and right leg forming a line slightly slanting from rear to front; the right heel raised from the ground, the lower limbs supple, the left knee bent, the right nearly straight; the arms hanging naturally by the sides, the palms open, but not spread, and turned inwards towards the thighs, but not touching them; the fingers together, but not extended; the whole column of the body unconstrained; the head and neck perfectly free (Fig. 1).

Fig. 1.



Press lightly from the right foot, quit the ground and let the limb swing to the front, the body retaining its forward inclination. When the right foot has swung to the front the length of the step, softly place it on the ground, the heel first, the toes last, and as these descend raise the heel of the left, now relieved of the weight of the body, which will have been transferred to the right. Repeat.

After the slow time, in order to acquire correct action and position, walking should be practised as follows:—

EXERCISE 2. (COURSE I) .	Half Speed .	Short Distance.
EXERCISE 3. (COURSE II) .	At Speed .	Short Distance.
EXERCISE 4. (COURSE III) .	At Speed .	Long Distance.

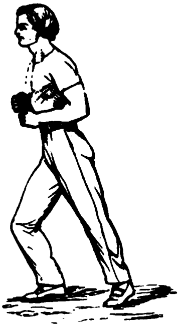
RUNNING.

Slow time—short distance.

EXERCISE I.
COURSE I.

The position the same as in walking, except that the arms are bent at the elbows; the forearm held in a horizontal line, the hands to the front and closed, the thumbs inwards (Fig. 1).

Fig. 1.



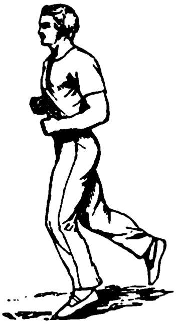
The step also the same as in walking, except that the left foot is lifted before the right reaches the ground; the knees are more bent than in walking, the foot is lifted farther from the ground, and the column of the body pressed more strongly to the front.

After the slow time, in order to acquire correct action and position, running should be practised as follows:—

EXERCISE 2. (COURSE I) . Half Speed . Short Distance.
EXERCISE 3. (COURSE II) . At Speed . Short Distance.
EXERCISE 4. (COURSE *III*) . At Speed . Long Distance.

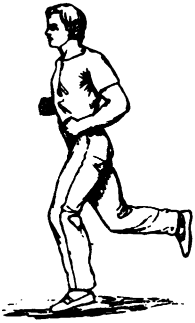
The action and position are the same in all rates of speed, except that as the pace increases the step is wider and the foot lifted higher on quitting the ground.

Fig. 2.



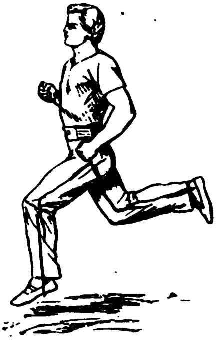
Slow Time.

Fig. 3.



Half Speed.

Fig. 4.



Speed.

LEAPING.

There is scarcely any exercise in which men improve so rapidly and to so great an extent as in the various modes of leaping, and there is scarcely any exercise which so powerfully contributes to the development of the lower limbs. The action is precisely that which the nature of the muscles themselves demands for their healthful growth and full development, namely, rapid contraction and expansion, with progressive and accumulative effort; while the power of concentrating the energies, of governing the action of the limbs, and of alighting on the spot and in the position desired, becomes, by practice of these various forms of leaping, completely under control.

The instructor must be careful to confine the learner to the simpler modes of leaping until he has acquired the power of making the limbs and trunk act harmoniously together, and of preserving the equilibrium of the body in every situation and position; and it must be borne in mind that the arrangement of the exercises in their proper course implies that these exercises are in a reasonably simple form; a barrier of great height or a ditch of great width convert the exercise into an arduous one and relegate it to a more advanced course. When practising leaping *depth*, the initiatory practice should be at a very slight depth, gradually increasing, but never under any circumstances should it be increased, or its difficulty otherwise augmented, until the action and position is correct. In leaping *height* the learner must never be allowed to leap at a stiff barrier; it in no way tests the power of the leaper better than a fragile one, or affords greater advantages in the practice, and there is no merit in doing anything dangerous when there is no equivalent to be gained for the risk undergone. Rails should be attempted only by well-trained and experienced leapers, for a slip of the foot may and does often happen with the best leapers, and such a mishap ought never to entail serious injury. In leaping *width*, over a dry ditch, for practice, the ditch should be shallow, and the sand or saw-dust at the bottom should be frequently stirred or softened. It is part of the instructor's duty to see that the banks are firm and equal before his class begins its practice.

The barrier for leaping *on* should be so constructed that it may be raised or lowered at pleasure, the top of it affording a firm resting-place for the feet. The barrier for leaping *over* should be formed of two standards about 6 feet high, fixed 5 or 6 feet apart. Between these a strong string, with a small flag in the centre, should be strained [1], looped round one of the posts, and lightly fastened to small iron pins, fixed a distance of one inch apart up the back of the other. The heights from the floor should be marked in inches up each of the posts. The machine for leaping *depth* should be a small wooden platform supported on iron brackets made to clip over the rounds of a ladder, vertical or inclined, the platform being raised or lowered the distance apart of the rounds, as required, and the ladder giving means of access to it.

FIRST SERIES . . . *Standing.*
SECOND SERIES . . . *Running.*

First Series.

Position of attention facing or sideways to the barrier, the toes a short distance from it varying with its height, to leap height; the toes at the edge of the mark, to leap width; the heels at the edge of the mark, to leap width to the rear; the toes at the edge of the platform, to leap depth.

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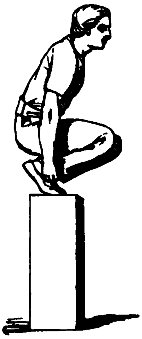
[1] This, for learners and in non-competitive efforts, is preferable to the stick in common use.

To leap height, in two movements.

EXERCISE I. COURSE I. 1. Bring the arms upwards and forwards to their full extension above the head, the hands closed, again bring them downward to the full extension, at the same time bending the knees until they jut over and beyond the toes, raising the heels and bringing the weight of the body and downward pressure on the fore part of the foot; repeat this movement three times, and after the third depression, spring from the feet, rising above and alighting on the barrier, resting on the fore part of the foot, the knees bent low and jutting over and beyond the toes, the trunk of the body held low and compact, and bring the arms close in by the sides (Fig. 1).

2. Spring to the ground, preserving this position of body and extending the arms to the front.

Fig. 1.

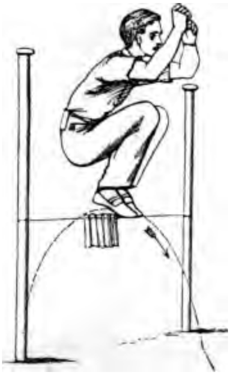


To leap height, in one movement.

EXERCISE 2. COURSE I. 1. Repeat the preliminary movements to the spring, but let the act of propulsion of the feet be directed more to the front.

2. Clear the barrier (Fig. 2), and descend yielding.

Fig. 2.



To leap height, one movement, the left side leading.

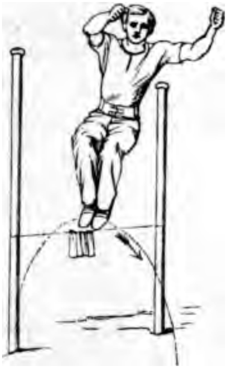
EXERCISE 3.
COURSE I.

1. Repeat the preliminary movements to the spring, giving the arms a lateral inclination (towards the barrier) on their elevation.

2. Spring from the feet in the same direction, clearing the barrier (Fig. 3), and descend yielding (the barrier on the right).

This exercise to be repeated with the right side leading.

Fig. 3.



To leap width.

EXERCISE 4.
COURSE I.

1. Bring the arms slowly upward and forward to the line of the shoulder, the hands closed (Fig. 4); bring them again downward and rearward to their full extension, at the same time depressing the lower limbs as previously described; repeat these movements three times.

Fig. 4.

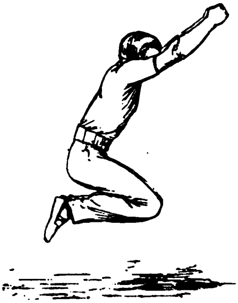
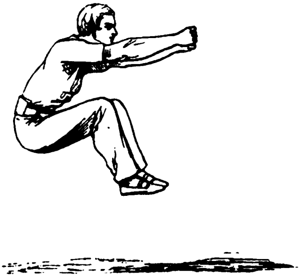


Fig. 5.



2. Spring from the feet with the entire force of propulsion of the lower limbs and at the same instant throw the upper limbs to the front (Fig. 5); descend yielding, but let the entire sole of the foot meet the ground.

To leap height and width combined.

EXERCISE 5.
COURSE III.

1. Repeat the preliminary movements to the spring.

2. Spring from the feet, clear the barrier and the space beyond; descend yielding.

If the barrier be the first part of the obstacle, throw the arms and incline the body to the front, on clearing it; if the second part, bend the back inwards on clearing it and throw the hands to the extension of the arms, to the front upwards; descend yielding.

To leap width, to the rear.

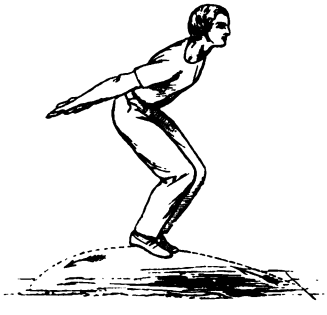
EXERCISE 6.
COURSE II.

1. Repeat the preliminary movements, carrying the downward extension of the arms farther to the rear.

2. Spring from the feet, throwing the arms energetically to the rear (Fig. 6), the hands open, the palms upwards; descend yielding.

As soon as the feet meet the ground, bring the hands down by the sides, the palms downwards and to the front.

Fig. 6.



To leap width, sideways.

EXERCISE 7.
COURSE II.

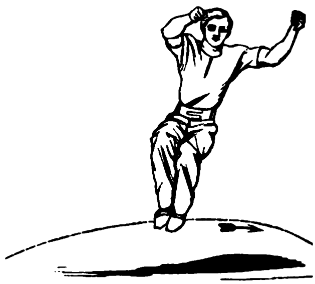
1. Slightly bend the knees, letting them jut over, but not beyond, the toes; swing the arms upwards and across the body in front;

on the return of the third swing or oscillation to th bend the knees steadily downward, the right lower th left, raising the heels and resting on the fore part of th

2. As the hands attain the culminating point, throw them rapidly and energetically to the right; at the same time spring from the feet with their entire concentrated force of propulsion (Fig. 7), and descend yielding.

This exercise to be repeated on the left.

Fig. 7.



To leap depth.

EXERCISE 8.
COURSE II.

1. Bend the knees until they jut ov toes, and above the space, raising the heels, and resting on the fore part of the foot; during the depression of the lower limbs extend the arms by the sides, the hands lightly closed, the column of the body inclined to the front, but held close and compact (Fig. 8).

2. Press lightly from the feet, and spring to the front with sufficient force only to bring the back clear of the edge of the platform or ditch, ϵ the arms to the front (Fig. 9), and descend yielding.

Fig. 8.

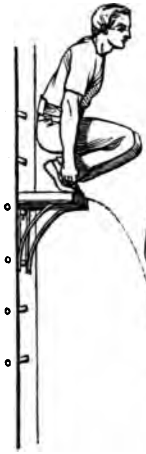
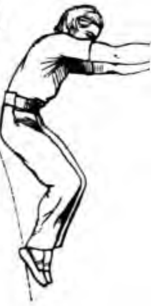


Fig. 9.



To leap depth, to the rear.

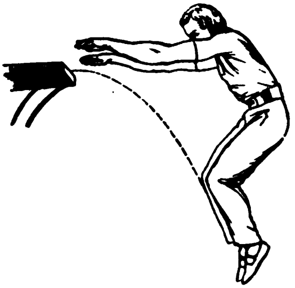
EXERCISE 9.
COURSE II.

1. Repeat the preliminary movements, carrying the downward extension of the arms fully to rear.

2. Spring lightly to the rear, throwing the hands forwards to the full extension of the arms (Fig. 10), and descend yielding.

If the equilibrium be lost and the body fall to the front, extend the arms as in Fig. 9; if to the rear, as in Fig. 6.

Fig. 10.



To leap width and depth combined, to the front.

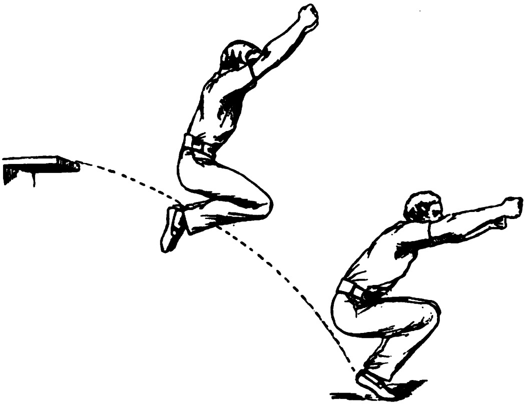
EXERCISE 10.
COURSE II.

1. (Look steadily at the spot desired to be reached.) Repeat the preliminary movements as in leaping depth.

2. Spring from the feet, and at the same instant throw the hands upwards and forwards (Fig. 11), clear the space, and descend yielding (Fig. 12).

Fig. 11.

Fig. 12.



To leap width and depth combined, to the rear.

EXERCISE 11.
COURSE III.

1. (Glance to the rear and determine on the spot to be reached in the leap.) Repeat the preliminary movements for leaping width to the rear.

2. Spring from the feet, at the same time throw the hands to the rear, open, with the palms downwards, and descend yielding.

To leap width and depth combined, to the rear.

A Second Method.

EXERCISE 12.
COURSE III.

1. Stoop down and grasp the ledge of the platform with both hands, the fingers and thumbs meeting, the fingers above (Fig. 13); if at the edge of a ditch, the fingers and thumbs together, the palm on its surface.

2. Spring from the feet, shooting them out to the rear, and at the same instant press strongly from the hands (Fig. 14); retain them in the front, the palms open, and descend yielding.

Fig. 13.

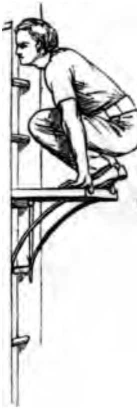
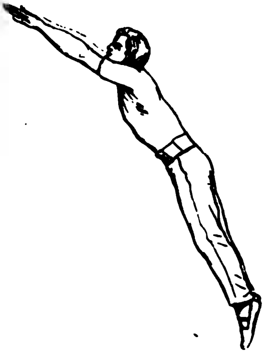
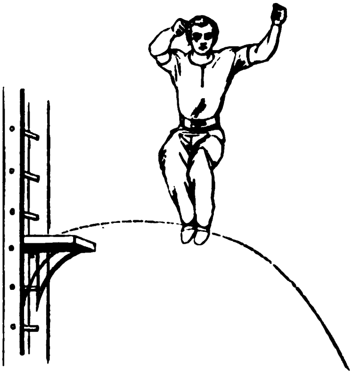


Fig. 14.



To leap width and depth combined, sideways.

Fig. 15.



EXERCISE 13. COURSE III. 1. Repeat the preliminary movements for leaping width sideways.

2. Spring from the feet, throwing the hands to the left front (Fig. 15); descend yielding.

This exercise to be repeated, the right side leading.

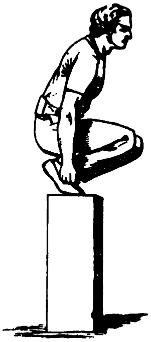
Second Series.

Position of attention, twenty or thirty paces from the barrier.

To leap height, two movements.

EXERCISE 14. COURSE I. 1. Begin the preliminary run, with short, well-measured steps, quickening the pace on the advance, and when within a few feet of the barrier (according to its height), spring from the foot making the last step, bring both knees close up in front, the hands being elevated at the instant of the spring as in first exercise, and alight upon the barrier, bringing the hands instantly down by the sides (Fig. 16).

Fig. 16.



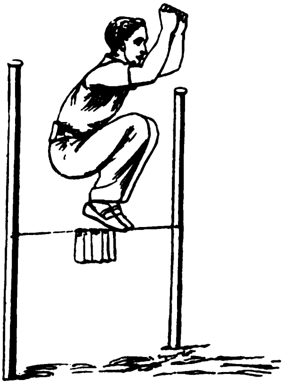
2. Spring to the ground, preserving this position of body and extending the arms to the front.

To leap height, one movement.

EXERCISE 15.
COURSE I.

1. Preliminary run as before, clear th barrier (Fig. 17), and descend yielding.

Fig. 17.



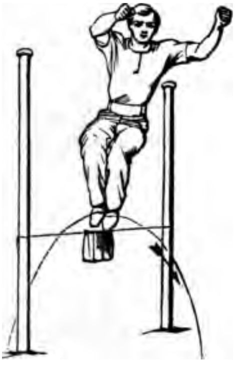
To leap height, one movement, the left side leading.

EXERCISE 16.
COURSE I.

1. The preliminary run as before, swerve slightly to the left in the last few steps, inclining the left shoulder forward, spring from the left foot, clear the barrier (Fig. 18), the left foot leading to the ground, and descend yielding, the barrier on the right.

This exercise to be repeated with the right side leading.

Fig. 18.



To leap width.

EXERCISE 17. COURSE I. 1. The preliminary run as before; spring from the foot making the last step, the whole act of propulsion of the spring and the momentum acquired in the run being directed to the front, the lower limbs closely bent up, the trunk of the body compact and firm, the hands closed and thrown to the front, as in Fig. 4; descend yielding, resting on the entire sole of the foot.

To leap height and width combined.

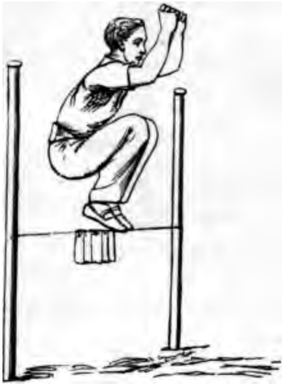
EXERCISE 18. COURSE III. 1. The preliminary run as before; spring from the foot making the last step; the effort should be to divide the momentum of the run, and that given by the propulsion of the spring, so that the obstacle in both aspects, height and width, shall be cleared; descend yielding.

To leap height, one movement.

EXERCISE 15.
COURSE I.

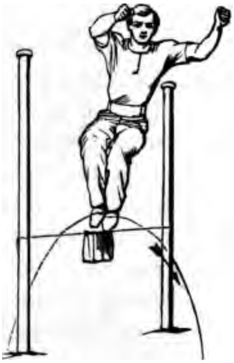
1. Preliminary run as before, clear th barrier (Fig. 17), and descend yielding.

Fig. 17.



To leap height, one movement, the left side leading.

Fig. 18.



EXERCISE 16.
COURSE I.

1. The preliminary run as before, swerve slightly to the left in the last few steps, inclining the left shoulder forward, spring from the left foot, clear the barrier (Fig. 18), the left foot leading to the ground, and descend yielding, the barrier on the right.

This exercise to be repeated with the right side leading.

To leap width.

RCISE 17.
RSE I.

1. The preliminary run as before; spring from the foot making the last step, the whole act of propulsion of the spring and the nentum acquired in the run being directed to the it, the lower limbs closely bent up, the trunk of the y compact and firm, the hands closed and thrown to the it, as in Fig. 4; descend yielding, resting on the entire of the foot.

To leap height and width combined.

RCISE 18.
RSE III.

1. The preliminary run as before; spring from the foot making the last step; the effort should be to divide the momentum he run, and that given by the propulsion of the spring, hat the obstacle in both aspects, height and width, shall leared; descend yielding.

THE LEAPING ROPE.

THE exercises with the leaping rope, and also those with the leaping pole, differ in certain features from all other modes of leaping; they employ a machine to aid the leaper in clearing the barrier, and they give employment to both the upper and the lower limbs, thus forming the connecting link between leaping and vaulting. The practice of these exercises is very good in an elementary sense, giving much action in a beneficial form to the trunk as well as to the limbs.

This machine is a strong rope suspended from a tie-beam or other point of attachment, over the centre of the string and posts already described for leaping height. It should reach within 4 feet of the ground.

Single Series.

Position of attention in front of the Barrier.

To leap height.

EXERCISE I.
COURSE I.

1. Raise both hands to the reach and grasp the rope, passing the end of it over the shoulder (Fig. 1); spring from the feet (slightly to the rear), bringing the lower limbs straight up in front of the face, letting the head and shoulders incline to the rear (Fig. 2); clear the barrier, bending

the back inwards, and shooting the feet to the front, the legs straight and together (Fig. 3); bring the head and shoulders to the front, quit the grasp of the hands, and descend yielding.

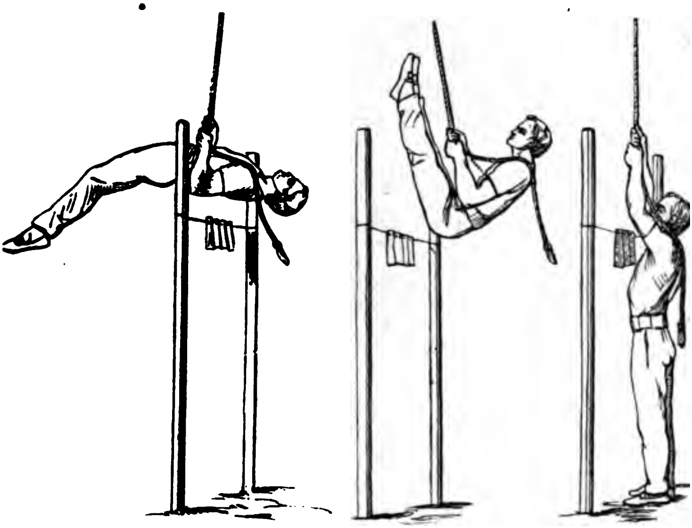


Fig. 3. Fig. 2. Fig. 1.

To leap height, hand over hand.

EXERCISE 2.
COURSE II.

1. Raise the right hand to the reach, spring from the feet, and bring the lower limbs up in front as previously described: during their rise, pass the left hand over the right, and again the right over the left, clear the barrier as in first exercise, and descend yielding.

This method to be used when the barrier is too high to be cleared, as directed in first exercise.

To leap width.

EXERCISE 3.
COURSE I.

1. Grasp the end of the rope with the left hand and step to the rear until the arm is at the reach, make a half face to the right, and take a short step to the front with the left foot, the knees slightly bent, the right arm extended by the side, the palm open and to the front, the fingers pointed to the ground (Fig. 4).

2. Lift the left foot from the ground, throwing the weight of the body to the rear, press strongly from the right foot, spring from the ground backwards, rapidly placing the feet together and swinging them to their farthest rearward point, the legs straight and together, the toes pointed, at the same time turning the body to the front, the arms bent at the half-reach, the head bent back (Fig. 5); begin the forward swing, bringing the lower limbs to the front and letting

Fig. 4.

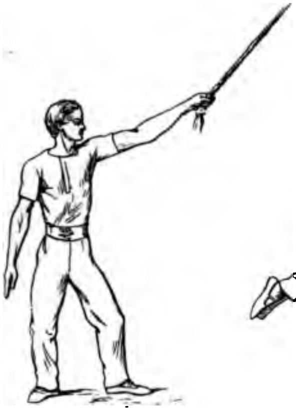
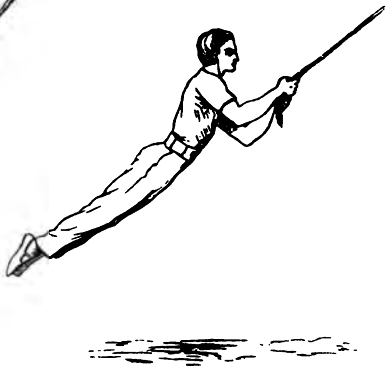


Fig. 5.



them rise as high as the hands (Fig. 6); when approaching the terminating point of the swing, lower the feet, quit the grasp of the hands, incline the head and shoulders to the front (Fig. 7), and descend yielding.

Fig. 6.

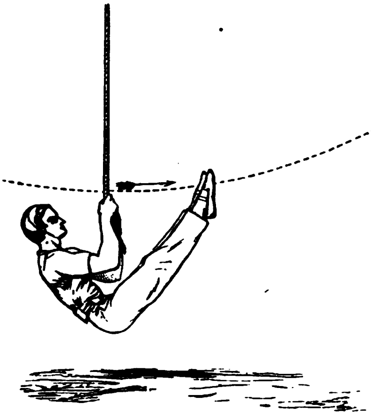
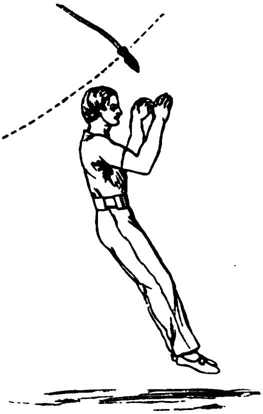


Fig. 7.



The double swing.

EXERCISE 4.
COURSE III.

1. Complete the previous exercise to the terminating point of the forward swing.

2. Instead of quitting the grasp, advance the right shoulder, wheel round, bringing the back upwards, throw the lower limbs high and free to the rear (thereby greatly increasing the momentum), begin the return swing, bringing the feet to the front as in the first swing; at its culminating point, advance the left shoulder, wheel round to the front, lower the feet, quit the grasp, inclining the body forward, and descend yielding.

THE LEAPING POLE.

The exercises with the leaping pole may almost be viewed as belonging to recreative rather than systematized exercise, being essentially for the open air, and among the few which may be left for free practice, after the learner has acquired a knowledge of the action and position of the different exercises. They are valuable as giving precision to the eye and hand, the power of calculating distance, and of rapidly determining the moment for executing a complicated movement, with the presence of mind to execute it, in addition to the physical exercise of the run and leap, the balance and descent.

The leaping pole should be of ash, about 1¾ inches in diameter, and from 8 feet to 10 feet long, perfectly smooth, and shod with iron at the butt or lower end.

First Series	. . . .	*Standing.*
Second Series	. . . .	*Running.*

First Series.

Position of attention, with the pole at the balance, i. e. held horizontally across the body with the arms bent, the butt of the pole held slanting to the front, the hands at the distance, the right hand to the front, the palms of the hands upwards, the fingers and thumbs meeting; or with the palm of the right hand downwards; distance—one pace from the mark, *to leap width; a short distance from the barrier, varying with its height, to leap height; at the edge of the ditch, to leap depth.*

To leap width.

EXERCISE I.
COURSE I.

1. Advance the right foot to the edge of the mark, advance the butt of the pole to the utmost reach, and fix it on the ground without displacing the feet or changing the grasp of the hands (Fig. 1).

Fig. 1.

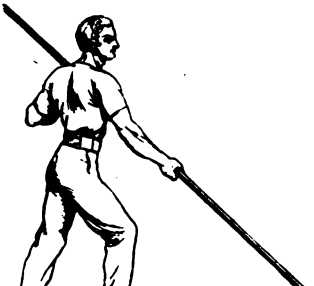
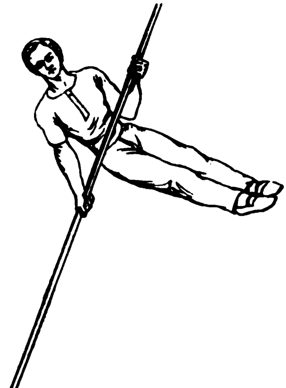


Fig. 2.



2. Spring from the feet, and pass by the left of the pole, the whole body with the lower limbs straight and extended in one line when passing the pole (Fig. 2); descend yielding, and as the feet meet the ground raise the pole to the balance.

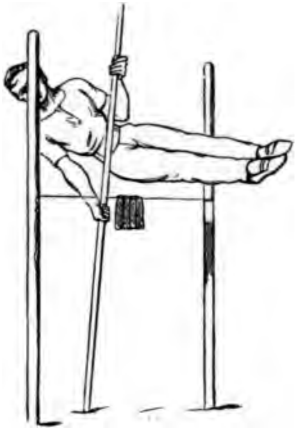
This exercise to be repeated, advancing the left foot to the mark, the left hand to the front, and passing by the right of the pole.

To leap height.

EXERCISE 2. COURSE II. 1. Advance the right foot as before, and place the butt of the pole within a few feet of the barrier (according to its height).

2. Spring from the feet and clear the barrier, passing by the left of the pole, the body and lower limbs in position in one line when clearing the barrier (Fig. 3); after clearing the barrier, quit the grasp of the pole, throwing it back to the starting-point, and descend yielding, facing the barrier.

Fig. 3.



This exercise to be repeated, advancing the left foot, the left hand to the front, and passing by the right of the pole.

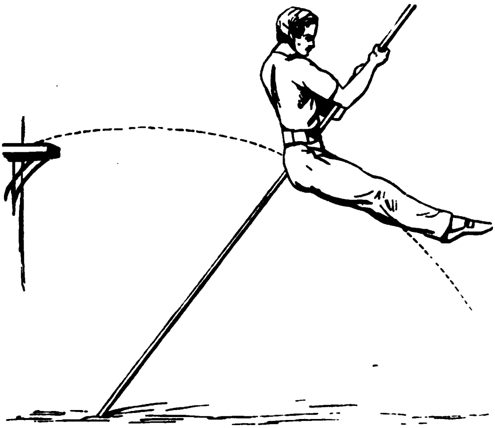
To leap depth.

EXERCISE 3. COURSE II. 1. Advance the pole and firmly plant the butt on the ground.

2. Press lightly from the feet, quit the platform or ground, passing by the right of the pole, the

trunk of the body in the line of the pole when passing it, the lower limbs at a right angle with it, the toes pointed to the front; continue the descent (Fig. 4), and when nearing the ground quit the grasp of the pole, throw it slightly to the left, and descend yielding.

Fig. 4.



This exercise to be repeated, passing by the left of the pole.

Second Series.

Position of attention, twenty or thirty paces from the edge of the ditch or barrier, the pole at the balance, the right hand to the front.

To leap width.

EXERCISE 4.
COURSE II.

1. Begin the advance with a short, light, and well-measured step, fixing the eye on the ditch and regarding it steadily; quicken the pace when nearing it, select the spot and plant the pole without halt, springing by the left, the position of body and lower limbs as in leaping width standing; descend yielding, bringing the pole to the balance.

This exercise to be repeated, advancing the left foot, passing by the right of the pole, the left hand to the front.

To leap height.

EXERCISE 5.
COURSE II.

Preliminary run as before; spring by the left and clear the barrier as leaping height standing; quit the grasp of the pole at the commencement of the descent, letting it fall to the rear without touching the barrier, and descend yielding, facing the barrier.

This exercise to be repeated, advancing the left foot, the left hand to the front, and passing by the right of the pole.

THE HORIZONTAL BEAM.

THE exercises on this machine follow in natural order the preceding simple exercises of progression. They do but carry such exercises one step farther, by increasing the difficulties of their execution.

In reality the physical difficulty of walking on a beam raised a foot above the floor is no greater than that of walking on one of the planks of the floor itself, provided the former is as firm as the latter, and its surface as level and secure to the foot; and to walk on a beam a hundred feet above the ground is physically no more difficult than either. Therefore the difficulty to be overcome in walking along an elevated beam presenting a surface sufficiently broad to admit of the complete placing of the foot, and free from all oscillation and vibration, is entirely mental, arising, it may be, from many and conflicting causes, in which actual fear has no share. It is most important that both instructor and learner should be aware of this, because from the latter it will remove an imaginary difficulty, while the former will, from it, see the propriety and necessity of patience and forbearance with the defects of beginners in the simplest exercises on this essentially rudimentary machine. The preservation of the equilibrium is the very essence of these exercises, and the acquirement of the power of maintaining it under difficulties is their avowed purpose and object.

The first series, *sitting*, is of the simplest description, and, as shown in the note introductory to the section, its exercises are executed in the position in which the equilibrium is maintained with the least effort.

The second series, *walking upright*, is of much greater difficulty than the first, but is still composed of exercises of a simple character.

Other exercises, such as some of those on the horizontal bar, and the second and third series on the slanting pole, may also be performed on the beam, but they properly belong to the machines in connexion with which they are described.

The instructor should walk by the side of the learner, to explain the action and position of the different exercises, and to give assistance when required.

This machine is a round wooden beam, not less than 25 feet long, 9 or 10 inches in diameter at one end, and 6 or 7 inches at the other, made to move up and down between standards, and supported on iron pins running through them.

FIRST SERIES . .	*Sitting.*
SECOND SERIES . .	*Upright.*
THIRD SERIES . .	*Changes of position.*

First Series.

Position of attention facing the beam.

The front march.

The beam low.

EXERCISE 1.
COURSE 1.

1. Place the hands on the beam at the distance, the thumbs and fingers straight and together, and pointed to the front; incline the head and shoulders to the front, lean strongly upon the hands, pass the right leg over by the rear, and

come to the seat astride of the beam, placing the hands upon the thighs (Fig. 1), the head erect, the breast advanced, the column of the body upright, the legs pendent on either side of the beam.

Fig. 1.

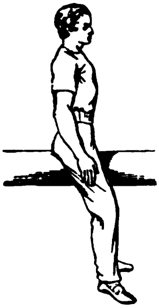


Fig 2.

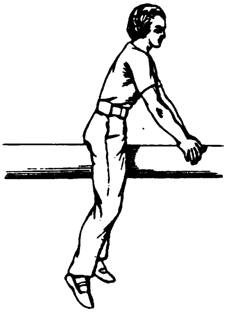
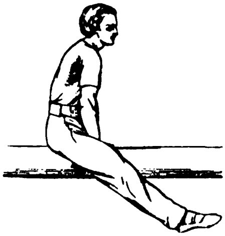


Fig. 3.



2. Incline the head and trunk to the front, advance the hands (Fig. 2), rest upon them, lift the body from the beam, and bring it up again to the hands, extending the lower limbs to the front, the toes pointed to the front (Fig. 3). Repeat.

In descending, pass the right leg by the rear over to the left, press lightly from the hands, and descend yielding.

The rear march.

EXERCISE 2.
COURSE I.

1. Come to the seat astride of the beam, passing the left leg by the rear over the beam.

2. Rest on the hands, elevate the feet in front nearly as high as the beam (Fig. 3), throw them to the rear to the reach of the arms, resting on the inner side of the thighs, the body lying inclined to the front (Fig. 2), bring both hands up to the thighs. Repeat.

In descending, pass the left leg by the rear over the beam.

The side march.

EXERCISE 3.
COURSE I.

1. Come to the seat astride of the beam, passing the right leg over it by the rear; pass the left hand to the rear, pass the right leg by the front over to the left side (Fig. 4).

2. Advance the left hand along the beam to the reach, inclining the body in the same direction (Fig. 5), lift the body up close to the left hand, preserving the balance, bring the right hand up to the body. Repeat.

In descending, press lightly from the hands, shoot out the lower limbs to the front, and descend yielding.

Fig. 4.

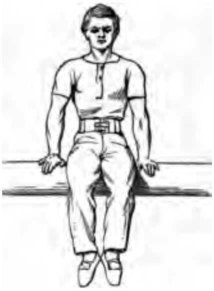
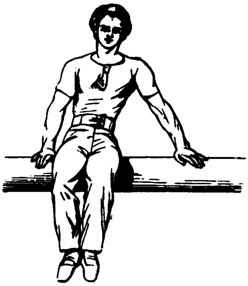


Fig. 5.



The front march, hands only.

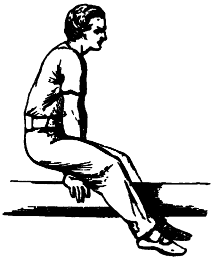
EXERCISE 4.
COURSE II.

1. Come to the seat astride of the beam, passing the right leg over it by the rear.

2. Rest upon the hands, rising from the seat, the lower limbs pendent, the toes pointed downward (Fig. 6); incline the body to the right front, advance the left hand; incline the body to the left front, advance the right hand beyond the left. Repeat.

Descend yielding, passing the right leg over the beam by the rear.

Fig. 6.



The front march, both hands at once.

EXERCISE 5. COURSE II. 1. Come to the seat astride of the beam, passing the right leg over it by the rear.

2. Rest upon the hands as in preceding exercise (Fig. 6), spring to the front with both hands, inclining the body to the front, the lower limbs compact, but free. Repeat.

Descend yielding, passing the right leg over the beam by the rear.

The rear march, both hands at once.

EXERCISE 6. COURSE II. 1. Come to the seat astride of the beam, passing the left leg over it by the rear.

2. Rest upon the hands, spring to the rear with both hands, inclining the body slightly to the front. Repeat.

Descend yielding, passing the left leg over the beam by the rear.

Second Series.

Position of attention facing the beam.

The front march, the left foot leading.

The beam high.

EXERCISE 7. COURSE I. 1. Raise the hands and place them on the beam at the distance, the thumbs and fingers together and pointed to the front; bend the knees, and on the return extension, spring from the ground, press strongly with the hands, extend the arms, and raise the trunk of the body above the beam, the legs straight and together, the feet together, and pointed to the ground (Fig. 7); pass the right leg over by the rear, and come to the seat astride of the beam, as in first exercise (Fig. 1); replace the hands, extend the lower limbs to the front (Fig. 8), incline the body forward, rest on the hands, sweep the feet by the rear, bending the legs, and

The side march.

EXERCISE 3.
COURSE I.

1. Come to the seat astride of the beam, passing the right leg over it by the rear; pass the left hand to the rear, pass the right leg by the front over to the left side (Fig. 4).

2. Advance the left hand along the beam to the reach, inclining the body in the same direction (Fig. 5), lift the body up close to the left hand, preserving the balance, bring the right hand up to the body. Repeat.

In descending, press lightly from the hands, shoot out the lower limbs to the front, and descend yielding.

Fig. 4.

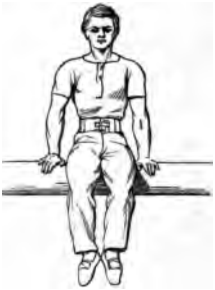
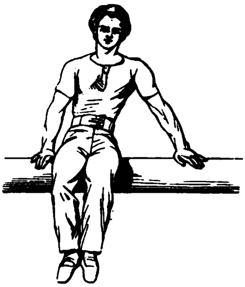


Fig. 5.



The front march, hands only.

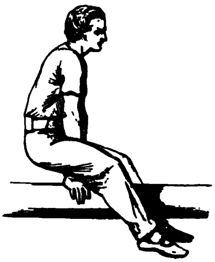
EXERCISE 4.
COURSE II.

1. Come to the seat astride of the beam, passing the right leg over it by the rear.

2. Rest upon the hands, rising from the seat, the lower limbs pendent, the toes pointed downward (Fig. 6); incline the body to the right front, advance the left hand; incline the body to the left front, advance the right hand beyond the left. Repeat.

Descend yielding, passing the right leg over the beam by the rear.

Fig. 6.



On descending come to the front, bend the knees, keeping the feet on the beam, advance the hands, the palm downwards, the fingers to the front, place them on the beam in front of the feet, as in the ascent (Fig. 9), rest on the hands, lift and separate the feet, and sink to the seat on the beam; complete the descent, passing the right leg over the beam by the rear.

This exercise to be repeated with the right foot leading.

The front march, right and left.

EXERCISE 8.
COURSE I.

1. Come to the upright position on the beam (Fig. 10).

2. Advance the left foot a pace along the beam, the toes pointed slightly outwards, incline the body to the front over the advanced foot, bring the right foot to the front and place it on the beam in advance of the left, the body as in preceding exercise. Repeat.

Descend as before.

The side march.

EXERCISE 9.
COURSE I.

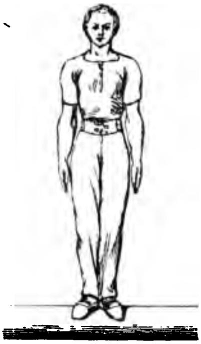
1. Come to the upright position on the beam.

2. Face to the right, bringing both feet across the beam, and resting on the hollow of the foot (Fig. 12); advance the left foot a short step along the beam, incline the body to the left over the foot, bring up the right foot close to the left. Repeat. The trunk of the body and the arms remaining in the position of attention throughout.

Face to the front, and descend as before.

This exercise to be repeated with the right foot leading.

Fig. 12.



The rear march, the left foot leading.

EXERCISE 10. COURSE I. 1. Come to the upright position on the beam, passing the left leg over it in mounting astride and bringing the back to the line of march.

2. Make a half face to the left, bringing the heel of the right foot into the hollow of the left, the right foot pointed straight along the beam, the left directly across the beam, the rest of the body in position.

3. Rest on the right foot, pass the left a step to the rear, rest on the left foot, and bring the right foot again up to the left. Repeat.

This exercise to be repeated with the right foot leading.

The rear march, right and left.

EXERCISE 11. COURSE I. 1. Come to the upright position on the beam, passing the left leg over it in mounting astride.

2. Rest on the right foot, pass the left a step to the rear, the toes first meeting the beam, the heel following; rest on the left foot and pass the right a step to the rear. Repeat.

To march to the front, one foot on the beam.

EXERCISE 12. COURSE II. 1. Come to the upright position on the beam, passing the right leg over it in mounting astride.

2. Bend the knees until they jut over the toes, inclining the body forward, and resting on the toes, the arms remaining extended by the sides; remove the left foot from the beam, let the leg fall straight by the side of the beam,

slightly to the rear, the toes pointed to the ground (Fig. 13); elevate the left leg to the front by the side of the beam, retaining it straight throughout, and place the heel upon the beam, a full step in advance of the right (Fig. 14), incline the body forward, bringing the toes of the left foot upon the beam, bend the left knee, the heel rising as the body advances; let the right leg gradually straighten until the instep rests upon the beam (Fig. 15); incline the head and shoulders to the front, let the right leg fall straight by the side of the beam, and complete the step as with the left. Repeat.

Fig. 13.

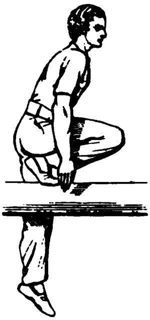


Fig. 14.

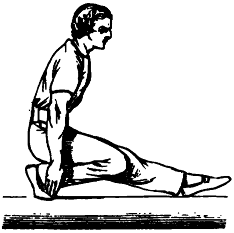
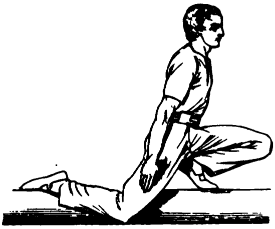


Fig. 15.



This exercise to be repeated backwards, reversing the movements.

Third Series.

To change front.

From the front and rear march, First Series.

EXERCISE 13. COURSE II. 1. Complete the step, placing the hands on the thighs.

2. Pass the right leg over the beam by the front, placing it beside the left; change the seat, pass the left over the beam, turning to the left, adjust the seat, coming square to the front.

To change front.

A Second Method.

EXERCISE 14.
COURSE II.

1. Complete the step, placing the hands upon the thighs.

2. Pass the right leg over the beam by the rear, at the same time changing the position of the left hand; throw the left leg over the beam, at the same time bringing the right hand opposite the left, and come square to the front.

To change position.

From the front and rear march upright on the beam.

EXERCISE 15.
COURSE II.

1. Complete the step.

2. Descend to the beam as in Figs. 9 and 8, and place the hands upon the thighs.

3. Replace the hands upon the beam, extend the lower limbs to the front as in Fig. 8, incline the body to the front, rest on the hands, and re-ascend as in seventh exercise (Fig. 9).

To rest on the beam.

From the front and rear march upright on the beam.

EXERCISE 16.
COURSE II.

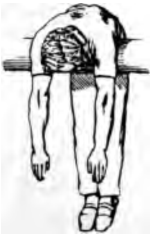
1. Complete the step.

2. Descend to the beam as before.

3. Incline to the front, pass the right leg over the beam by the rear, turning the body to the right, lean forward, rest upon the waist on the beam, let the arms fall pendent over the beam (Fig. 16), the legs together and straight, the toes pointed to the ground.

4. Reverse the order of the movements after resting.

Fig. 16.



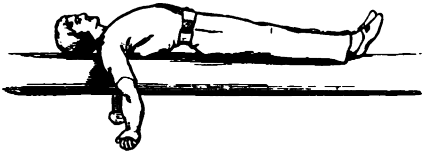
To lie extended on the beam.

From the seat astride of the beam.

EXERCISE 17.
COURSE III.

1. Advance the right leg to the front by the side of the beam, retaining it straight throughout, the toes pointed, till the whole leg is extended on the beam, the left leg following in similar manner. Slowly incline the body backward till the head rests upon the beam, meantime gradually extending the arms at the side till they reach the full expansion (Fig. 17).

Fig. 17.



In descending, part the legs and let them fall back along the side of the beam, and at the same time elevate the head and trunk till the seat astride of the beam is reached, the arms gradually resuming their original position by the sides. Descend to the ground, passing the right leg by the rear over the beam.

To pass upon the beam.

(Two men meeting.)

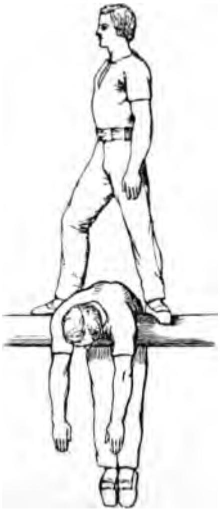
From the front march upright on the beam.

EXERCISE 18.
COURSE III.

1. Complete the step.

2. Let the first man come to the rest across the beam, as in preceding exercise, and the second then resume the march, passing the foot clearly over and beyond the trunk of the first man (Fig. 18), who will then rise as in preceding exercise and resume the march.

Fig. 18.



To pass upon the beam.

A Second Method.

EXERCISE 19.
COURSE III.

1. Let each man advance the right foot, place them together, the toes slightly turned outwards, then let each advance the right hand, and clasp the outside of the other's left arm near the shoulder, advance the left hand, and with the palm press against the other's right side, under the arm (Fig. 19); let each slowly incline to the front, resting on the right foot; remove the left foot from the beam, swing the leg round to the front (the body turning), and place it on the beam a short distance in advance of the right, making a complete turn with the body during the movement, and coming face to face (Fig. 20), giving and receiving support; let each lightly remove the hands, resume the front, and complete the march.

Fig. 19.

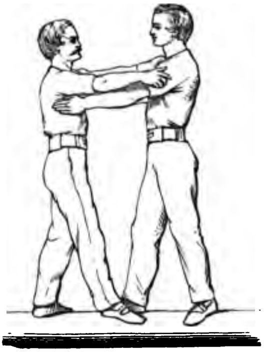
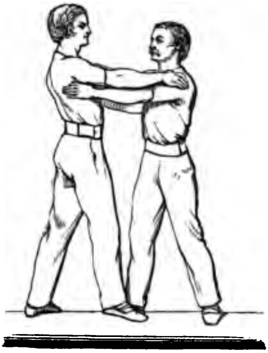


Fig. 20.

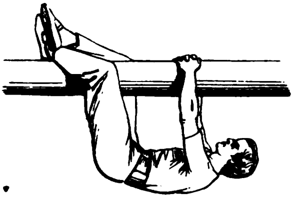


To descend from the beam.

From the seat astride of the beam, when the beam is raised.

EXERCISE 20. COURSE III. 1. Lean forward until the breast touches the beam, passing both hands under the beam and taking the intergrasp beneath, pass both legs around the beam and cross the ankles, the right in front of the left; slowly incline to the right, and let the body pass under the beam, the hands and feet ascending to the surface, as the trunk descends beneath it (Fig. 21); untwine the feet, and lower them to the vertical line, quit the grasp, and descend yielding.

Fig. 21.

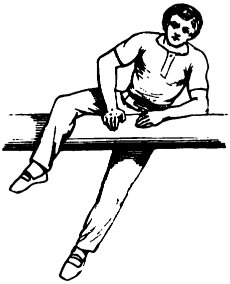


To re-ascend the beam.

From the position, under the beam, of preceding exercise.

EXERCISE 21. COURSE III. 1. Slowly detach the hands from their intergrasp above the beam, taking instead a strong clasp with the open palm, slowly relinquish the clasp of the left, and rapidly pass it under the beam by the front to the right side, at the same time swinging the left leg under the beam with sufficient force to raise the head and shoulders above the beam on the same side; hold strongly by the clasp of the hands, pass the right leg over the beam until the thigh is on its surface, bring the left arm on the surface of the beam (Fig. 22), elevate the trunk, and rise, seated on the beam.

Fig. 22



All the exercises on the underside of the slanting pole may be executed on the beam, advancing the whole hand as far as the wrist, on its surface.

Also, the exercises in rising above the horizontal bar, the open clasp of the palm being substituted for the grasp of the closed hand.

THE VAULTING BAR.

NOTHING could more distinctly show the nature and importance of progressive exercise than the apparatus employed, each succeeding machine presenting in a more difficult form the exercises of its predecessor. Thus, as running naturally followed walking, and leaping followed the race at speed, so the modified leap with the rope and pole is introductory to vaulting, where, from playing a secondary part, the upper limbs pass to one of equal importance with the lower ones.

The bar, of which the girth will admit of its being grasped by the hand, and which can be elevated and depressed to suit the capacity of the learner, is the most simple form of the vaulting machine; and as will be seen by the description in the text of the action and position preparatory to the rise, it is similar to the first standing leap; with this distinguishing difference, that the hands grasp the barrier, and the upper limbs take up the effort after the lower limbs have completed the spring.

In the first form of vaulting the body is carried over the barrier in a horizontal line, being from head to foot, when above the bar, in the exact line of the bar itself. In the second form, the lower half of the body is lifted by the action of the loins, elongated and elevated vertically above the hands, and thrown straight to the front. A third form, which unites in some degree both of these, is when the body from the vertical position above the bar is thrown to the right or left front, according to the side on which the vault is to be made. All these forms of vaulting require special care on the part of the instructor, who should impress upon the learner at every opportunity the necessity for keeping the lower limbs in position and close together.

The simpler position of the ordinary vault (Fig. 3), with the arms bent and the body in a horizontal line, should be strictly adhered to at this stage; and the hollow-back vault with straight arms (cf. Fig. 28 of the Vaulting Horse) reserved for practice on the Horse and Parallel Bars.

The position of the instructor should be in front of the learner, with one hand grasping the wrist nearest to him, and the other held in readiness to give assistance if required.

The vaulting bar should be of ash (specially selected for its straightness and freedom from knots) turned perfectly round, 2¼ inches in diameter, except at the ends, where square shoulders or 'tenons' should be formed, to run up and down the grooves or space between the standards. The standards should be 7 feet apart and 7 feet high, formed in two pieces with a space of 1¾ inches between them to receive the shoulders at the ends of the bar, and pierced with holes 3 inches apart, fitted with moveable wrought-iron pins for the bar to rest on. Where it is desired to have the bar of less diameter, it should be bored throughout its length, and a steel rod or 'core,' specially tempered, inserted, terminating at each end in a brass cap, fitting the shoulder of the bar. In cases where space is an object, or where the classwork does not necessitate two machines, the ordinary horizontal bar will do duty for the vaulting bar.

THE VAULTING BAR.

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This exercise to be repeated on the left.

To vault over the bar in two movements.

EXERCISE 2.
COURSE II.

1. Come to the Rest above the bar (Fig

2. Lean forward across the bar, press lower limbs to the front under the bar, as they return to the rear throw them to the right, clear bar in position (Fig. 3), quit the grasp of the hands, descend yielding, facing the bar.

This exercise to be repeated on the left.

To vault over the bar in one movement.

EXERCISE 3.
COURSE II.

1. Raise both hands and grasp the ba above described, press from both hands feet simultaneously, throw both feet the lower limbs in position to the right, clear the the trunk and lower limbs in the position of first exe (Fig 3), quit the grasp, and descend yielding.

During this exercise the body should make a com turn the feet describing a semicircle diagonally, the c at each point of the ascent and descent being continu turned towards the bar, the position of the body on completion of the descent being as distinctly facing the as it was preparatory to the ascent.

This exercise to be repeated on the left.

This exercise, together with the two succeeding o will, of course, vary in difficulty according to the heigh the bar.

To vault over the bar between the hands.

EXERCISE 4.
COURSE III.

1. Grasp the bar with the hands at the distance, bend the legs and on their return extension spring from the ground, press strongly with the hands, incline the head and shoulders forward, extend the arms and bring the knees straight up between them. Shoot the feet through the space between the hands, press from the hands, and descend yielding. Cf. Figs. 10, 11, 12 of the Vaulting Horse (p. 108).

To vault over the bar, the legs astride.

EXERCISE 5.
COURSE III.

1. Grasp the bar with the hands together, and proceed as before until the spring from the ground. At this point open the legs to their full extension, inclining the head and shoulders forward, and as the legs are shot in position over the bar press strongly with the hands, and bringing the legs rapidly together, descend yielding.

Cf. Fig. 13 of the Vaulting Horse (p. 109).

To vault over the bar by the back lift.

EXERCISE 6.
COURSE III.

1. Grasp the bar with the hands at the distance, press strongly with the hands and feet simultaneously, and throw the body over the bar in a straight line vertically above the head, the arms bending during its ascent, the elbows held close in by the sides, the head and shoulders inclined to the front, the

column of the body and the lower limbs with the toes pointed upward in a vertical line when above the bar (Fig. 4); from

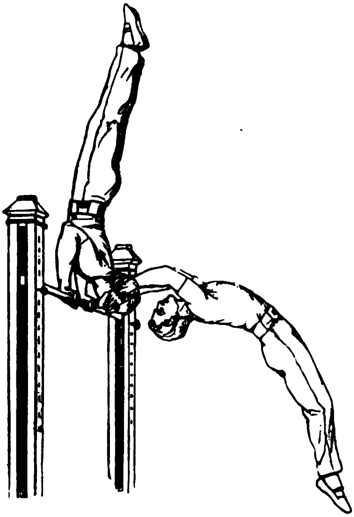


Fig. 4. Fig. 5.

this point throw the feet to the front, bending the back inwards, and raising the head as the feet approach the ground, quit the grasp (Fig. 5), and descend yielding, the back to the bar.

To vault over the bar by the back lift, in two movements.

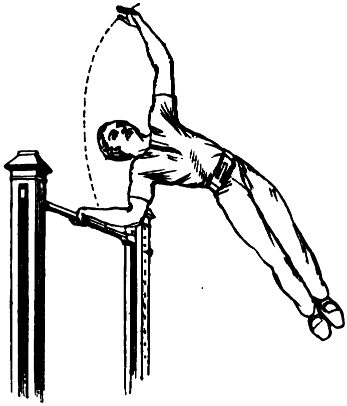
EXERCISE 7. 1. Come to the Rest above the bar (Fig. 1).
COURSE III. 2. Lean forward over the bar, press the lower limbs to the front under it, and as they return to the rear, throw them straight above the head as in Fig. 4, the arms bending during the ascent; clear the bar, and descend with the back to it (Fig. 5).

To vault the bar over one hand.

EXERCISE 8.
COURSE IV.

1. As in the back lift, but during the elevation of the lower limbs above the bar, instead of retaining the body between the hands, incline it over the right arm, the trunk and lower limbs turning towards the right; complete the elevation of the lower limbs until they rise straight above the bar over the grasp of the right hand, quit the grasp of the left, and pass it above the head; let the feet descend (Fig. 6), the right side next the bar, quit the grasp of the right hand, and descend yielding.

Fig. 6.



This exercise to be repeated over the left hand.

To vault the bar with the hands only.

EXERCISE 9.
COURSE IV.

1. Spring up and grasp the bar at the distance with both hands, and in lifting the feet from the ground press them to the front under the bar; on their return oscillation, rapidly bend the arms, until the breast rises above the bar, press strongly with the hands, continue the upward movement of the body, and at the same time throw the lower limbs in position to the right, clear the bar, and descend yielding.

This exercise to be repeated on the left.

To vault the bar with the hands only, by the back lift.

EXERCISE 10. COURSE IV. 1. As in preceding exercise until the breast rises above the bar, at this point press the elbows close in by the sides, incline the head and shoulders to the front, elevate the lower limbs vertically above the head as shown in Fig. 4, and descend yielding (Fig. 5).

To vault the bar with the hands only, over one hand.

EXERCISE 11. COURSE IV. 1. As in preceding exercise, but during the elevation of the lower limbs above the bar, incline the body over the right arm, complete the elevation of the lower limbs, and let the feet descend, the right side next the bar (Fig. 6).

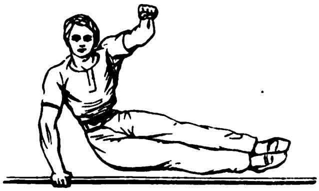
This exercise to be repeated over the left hand.

To vault the bar with one hand.

Flank vault.

EXERCISE 12. COURSE IV. 1. Grasp the bar strongly with the left hand, slightly bend the lower limbs, and on their return extension, spring from the ground, incline the body strongly over the right arm, rapidly elevate the left hand above the head, and pass the lower limbs, straight and together, over the bar (Fig. 7); quit the grasp, and descend yielding, facing the bar.

Fig. 7.



This exercise to be repeated with the right hand.

To vault the bar with one hand.

Front vault.

EXERCISE 13.
COURSE IV.

1. As in the preceding exercise throughout, except that in the bringing of the body in position over the bar, the chest should be continually turning towards it, the legs straight and together, the toes pointed, the whole body forming one horizontal line as in the vault with both hands, the right arm extended and swinging with the body. Descend yielding and facing the bar. Cf. Fig. 22 of the Vaulting Horse.

This exercise to be repeated with the right hand.

To vault the bar with one hand.

Rear vault.

EXERCISE 14.
COURSE IV.

1. As in the preceding exercise, except that in the bringing of the body in position over the bar, the chest is quickly turned away from and the rear turned towards the horse, and the legs passed in position over it. Cf. Fig. 23 of the Vaulting Horse.

THE VAULTING HORSE.

THIS is a machine of a much higher order than the bar, and presenting a much wider range of exercises, second to none in value and number.

The three series into which the exercises divide themselves are very distinctly marked, and admit of progressive practice long after the correct action and position have been attained, by increasing the elevation of the machine.

These exercises can scarcely be too frequently practised, as they give valuable and widely varied employment to both upper and lower limbs, and also to the trunk; and this machine is always found an excellent one with which to begin the lesson, because it affords much and rapid movement without severe or localized effort. The first series is clearly introductory to the second. The third series is very artistic and effective, and cultivates to the highest attainable point that precision and security of grasp and spring which are so valuable in all exercises when practically applied.

The position of the instructor should be close to the machine, in front of the learner, directing every motion, and in the early stages of his practice counting the time of his movements, and pointing out to him the features of the position in the ascent, rest, and descent. The instructor should also repeatedly execute the exercise himself in the manner most likely to make the learner comprehend its peculiarities, at the same time encouraging him, if timid or hesitating, and losing no opportunity of obtaining his entire confidence and trust in every situation however critical, remembering always that nothing will so readily make a man fall as the fear of falling.

There should be at least two vaulting horses in a gymnasium, of the respective heights of 4 feet and 5 feet; where a third is provided, its height should be 5 feet 6 inches. In cases where there is only space for a single horse in the gymnasium, the legs can be made to move up or down according to the height required. The bodies should be formed of blocks of wood from 5 feet to 5 feet 6 inches in length, and 12 inches in width, supported by strong framed legs screwed to the floor. The tops should be carefully rounded in every direction, so as to give a convenient seat for the body, and surface for the hands, whether the horse be used from the sides, or from the croup. The centre portion should be carefully padded and covered with strong leather.

For vaulting with one hand, circling, feint exercises &c. (cf. Exercises 17, 18 and their variations), it is customary to have pommels fitted on the horse, in order to increase the 'purchase' of the grasp and give sufficient elevation above the saddle; and this is specially the case in German gymnasia, where leg circling and such like variations are much in vogue. These movements will be found more fully described in the Appendix to the Horse. The pommels however are merely of use in giving variety and in tricky work, the ordinary smooth saddle being better suited to the needs of physical education.

Another form of the horse, practical at any time, and specially useful where width and space are required (as in several exercises of the Appendix to the Horse), is a padded table, covered with leather, which may be raised up or down in a similar manner to the horse.

First Series . . . *Standing.*
Second Series . . . *Running.*
Third Series . . . *By the croup.*

Preliminary Movement.

To come to the rest upon the horse.

COURSE I. Raise the hands and place them at the distance on the back of the horse, the thumbs and fingers straight and together, and pointed to the front (Fig. 1); bend the legs, and on their return extension spring from the ground, inclining the body to the front, press strongly with the hands, extend the arms, and raise the trunk of the body to the rest above the horse, the legs straight and together, the feet together, and pointed to the ground (Fig. 2).

Fig. 1.

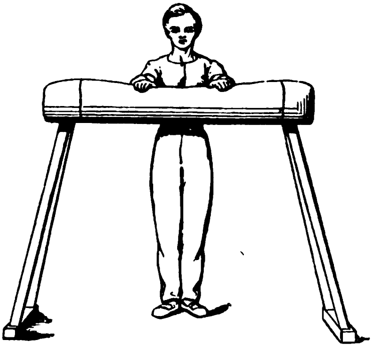
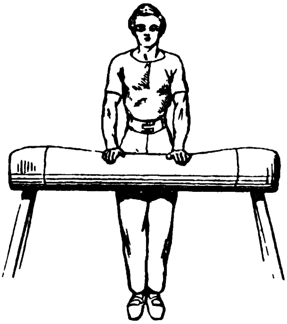


Fig. 2.



First Series.

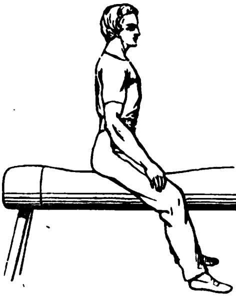
Position of attention, close beside and facing the horse; in one handed vaults facing the line of the horse.

To vault on the horse in two movements.

EXERCISE I. 1. Come to the Rest upon the horse.

COURSE I 2. Elevate the right leg, and by a continuous movement bring it over the back of the horse, the column of the body turning with it; and as the right thigh approaches the right hand, advance the latter in a line with the left hand, and slowly lower the body to the saddle, bringing the head erect and the chest and trunk well advanced, the hands lightly resting on the thighs, the lower limbs pendent, the toes pointed to the front (Fig. 3).

Fig. 3.



In descending, incline the head and trunk of the body to the front, elevate the left leg to the rear until it clears the back of the horse, the right rising to meet it, press from the hands, and descend yielding, facing the horse.

This exercise to be repeated on the left.

To vault on the horse in one movement.

EXERCISE 2.
COURSE I.

1. As in the previous exercise, except that the right leg should ascend and clear the back of the horse, in a continuous movement from the ground to the seat in the saddle.

Descend as before.

This exercise to be repeated on the left.

To vault over the horse in two movements.

EXERCISE 3. COURSE I. 1. Come to the Rest above the horse (Fig. 4).

2. Elevate both limbs in position to the right, and pass them over the horse, incline the head and shoulders forward, advancing the right hand in a line with the left (Fig. 5), press from both hands, and descend yielding, facing the horse.

Fig. 4.

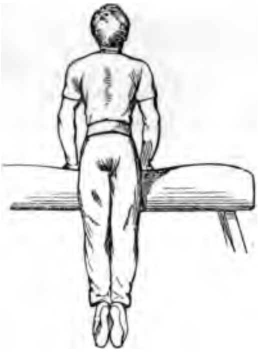
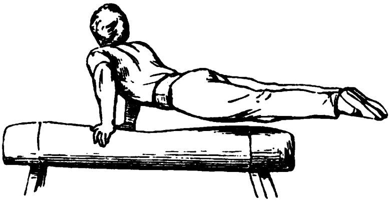


Fig. 5.



This exercise to be repeated, passing by the left.

To vault over the horse in one movement.

EXERCISE 4. COURSE I. 1. As in previous exercise, except that the legs should ascend and clear the back of the horse in one continuous movement; after the advance of the right hand, press strongly from both and descend yielding, facing the horse.

As the body clears the horse the trunk and lower limbs should be extended in the line of the horse, the arms bent, the chest advanced, the head thrown back.

This exercise to be repeated, passing by the left.

To vault on the horse resting on the knees.

EXERCISE 5. COURSE I. 1. Raise the hands and place them at the distance on the back of the horse, as in Fig. 1; bend the legs, and on their return extension spring from the ground, press strongly with the hands, incline the head and shoulders forward, extend the arms, and bring the knees straight up between them, resting on the saddle (Fig. 6). In descending, rapidly throw the hands to the front, as high as the face, spring from the rest on the knees with the lower limbs, upward and forward (Fig. 7), and descend yielding (Fig. 8).

Fig. 6.

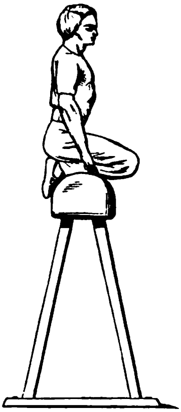


Fig. 7.

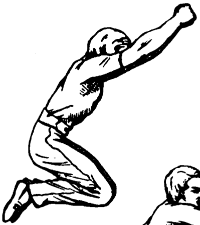
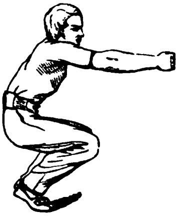
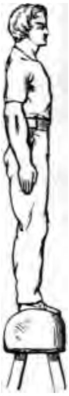


Fig. 8.



To vault on the horse resting on the feet.

Fig. 9.



EXERCISE 6.
COURSE II.

1. As in the preceding exercise, except that the knees should be brought up between the arms until they are as high as the breast and the feet instead of the knees brought to the rest on the saddle; immediately straighten the legs and come to the position of attention (Fig. 9).

In descending, spring straight to the front, and descend yielding.

To vault over the horse between the hands.

EXERCISE 7.
COURSE III.

1. Spring from the ground and bring the knees up between the arms to the breast as as in the previous exercise, but instead of letting the feet rest on the saddle let them be shot through the space between the hands (Figs. 10, 11, and 12); press from the hands, and descend yielding.

Fig. 10.

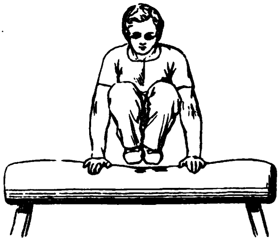


Fig. 11.

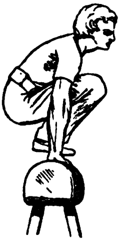
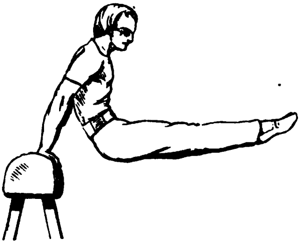


Fig. 12.

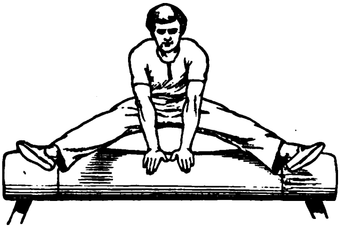


To vault over the horse, the legs astride.

EXERCISE 8.
COURSE III.

1. Place the hands on the horse and bend the legs for the spring as before, and immediately on the spring from the ground let them be opened to their full extension ; incline the head and shoulders forward, press strongly with the hands, and shoot the legs in position over the horse outside the arms (Fig. 13). Bring the legs rapidly together, and descend yielding.

Fig. 13.



To vault over the horse by the back lift.

EXERCISE 9.
COURSE III.

1. On the spring from the ground depress the head and shoulders until the latter are as low as the hands, and at the same time elevate the lower limbs, hips, and loins by the rear until they rise perpendicularly over the hands (Fig. 14), the

legs straight and together, the toes pointed upwards ; continue the sweep of the lower limbs, let the feet fall to the front, bending the back inwards (Fig. 15), and descend yielding.

Fig. 14.

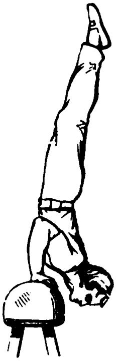
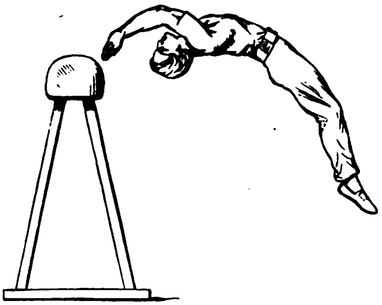


Fig. 15.



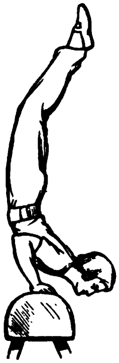
To vault over the horse by the back lift.

The back hollow.

EXERCISE 10.
COURSE IV.

1. Precisely as in the preceding exercise, except that on the spring from the ground the back is immediately curved inwards, the head and shoulders being thrown well back ; and this position is maintained throughout the exercise.

Fig. 16.



To vault over the horse by the back lift.

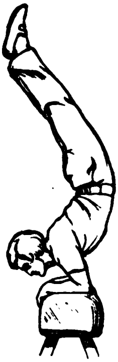
Resting on the forearm.

EXERCISE 11.
COURSE IV.

1. Precisely as in the back lift over the horse (Figs. 14, 15 and 16), with the exception that, instead of the hands, the whole of the forearm to the elbow is placed upon the horse previously to the spring; thence the sweep of the limbs over the horse is continued in one movement (Fig. 17).

When in a perpendicular position above the horse a pause may be made, thus showing the forearm balance.

Fig 17.



To vault over the horse by the back lift.

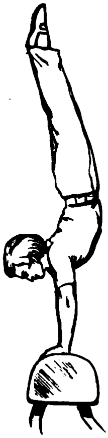
Showing the straight-arm balance.

EXERCISE 12.
COURSE IV.

1. Proceed with the back lift over the horse until the body is in a perpendicular position above it (short-arm balance, Fig. 16).

2. Instead of continuing the sweep of the limbs over the horse in one movement, pause and by strong pressure of the hands and wrists straighten the arms to the full extension (Fig. 18). Retain this position for a moment, and complete the sweep of the limbs over the head and descend yielding.

Fig. 18.



legs straight and together, the toes pointed upwards; continue the sweep of the lower limbs, let the feet fall to the front, bending the back inwards (Fig. 15), and descend yielding.

Fig. 14.

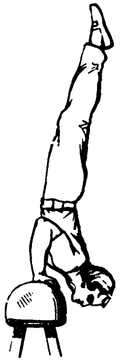
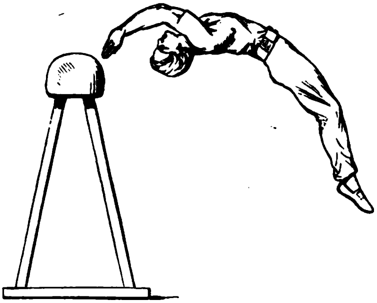


Fig. 15.



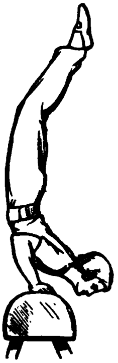
To vault over the horse by the back lift.

The back hollow.

EXERCISE 10.
COURSE IV.

1. Precisely as in the preceding exercise, except that on the spring from the ground the back is immediately curved inwards, the head and shoulders being thrown well back; and this position is maintained throughout the exercise.

Fig. 16.



To vault over the horse by the back lift.

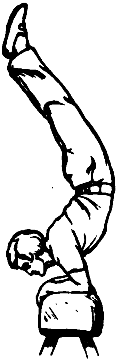
Resting on the forearm.

EXERCISE 11.
COURSE IV.

1. Precisely as in the back lift over the horse (Figs. 14, 15 and 16), with the exception that, instead of the hands, the whole of the forearm to the elbow is placed upon the horse previously to the spring; thence the sweep of the limbs over the horse is continued in one movement (Fig. 17).

When in a perpendicular position above the horse a pause may be made, thus showing the forearm balance.

Fig 17.



To vault over the horse by the back lift.

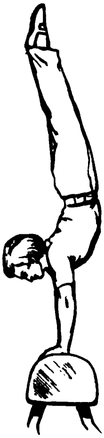
Showing the straight-arm balance.

EXERCISE 12.
COURSE IV.

1. Proceed with the back lift over the horse until the body is in a perpendicular position above it (short-arm balance, Fig. 16).

2. Instead of continuing the sweep of the limbs over the horse in one movement, pause and by strong pressure of the hands and wrists straighten the arms to the full extension (Fig. 18). Retain this position for a moment, and complete the sweep of the limbs over the head and descend yielding.

Fig. 18.



To vault the horse by the back lift over one hand.

EXERCISE 13.
COURSE IV.

1. As in the back lift to the perpendicular position above the horse. Without pause advance the right hand into line with the left, turning the body in position with it, and pass the limbs in one continuous movement (cf. Vaulting Bar, Fig. 6, p. 99) over the horse, descending yielding, facing the line of the horse, the horse on the right.

This exercise to be repeated, advancing the left hand into line with the right.

To vault over the horse by the back lift and turn.

EXERCISE 14.
COURSE IV.

1. As in the preceding exercise, until the right hand is brought into line with the left, but in continuing the sweep of the limbs over the horse, the body is quickly turned to the left, the left hand shifted, and the descent made facing the horse.

To vault on the horse with one hand.

EXERCISE 15.
COURSE III.

1. Raise the left hand and place it on the horse, and extend the right arm to the rear (Fig. 19). Bend the legs for the spring, and on the return extension elevate the right leg, and pass it over the horse, at the same time rapidly elevating the right

arm above the head, the hand closed, and come to the seat in the saddle (Fig. 20).

Fig. 19.

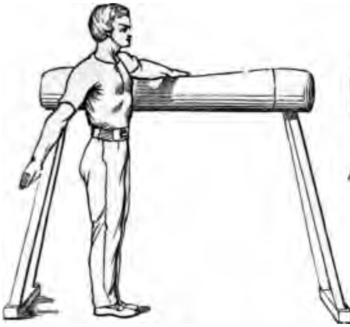
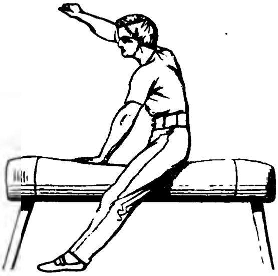


Fig. 20.



In descending, incline the head and shoulders to the front, press strongly from the left hand, and descend facing the horse.

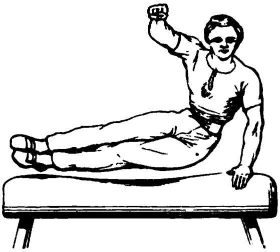
This exercise to be repeated with the right hand.

To vault over the horse with one hand.

Flank vault.

EXERCISE 16. COURSE IV. 1. Place the left hand on the horse and extend the right as in the preceding exercise. Spring as before; press strongly with the left hand, elevate the right, pass the lower limbs in position over the horse (Fig. 21), and descend yieldi the horse on the left.

Fig. 21.



This exercise to be repeated with the right hand.

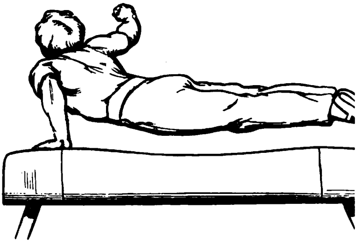
To vault over the horse with one hand.

Front vault.

EXERCISE 17.
COURSE IV.

1. As in the preceding exercise, ex that during the bringing of the body in position over the horse the chest should be continually turning towards the horse, the legs straight and together, the toes pointed, the whole body forming one horizontal line as in the vault with hands, the right arm extended and swinging with the b Descend as before, yielding, the horse on the left.

Fig. 22.



This exercise to be repeated with the right hand.

To vault over the horse with one hand.

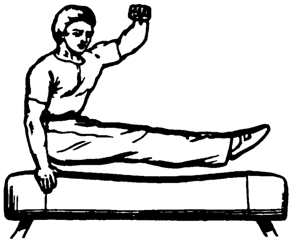
Rear vault.

EXERCISE 18.
COURSE IV.

1. Place the left hand on the horse and spring as before, but let the chest be quickly turned away from, and the rear turned towards the horse, and the legs passed in position over it.

The descent is made facing the line of the horse, with the horse on the right.

Fig. 23.

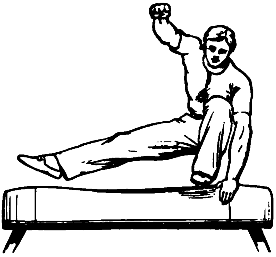


This exercise to be repeated with the right hand (Fig. 23).

VARIATIONS.
COURSE IV.

Variations of the previous exercise are made by extending the right or left leg only, at the same time bringing the knee of the other leg well up towards the chest. The descent is similar to that in the previous exercise.

Fig. 24.



Second Series.

Position of attention, 25 *or* 30 *feet from the horse.*

To vault on the horse.

EXERCISE 19.
COURSE I.

Slowly begin the run, quickening the pace on the advance, and looking straight at the horse; when within 2 or 3 feet of the horse, spring from both feet, striking them full and flat upon the ground, the hands taking their place on the back of the horse immediately after the spring, pass the right leg over the horse, and come to the seat in the saddle in one movement, as in Fig. 3.

In descending, incline the head and trunk of the body to the front, elevate the lower limbs to the rear straight above the horse, the toes pointed upward (Fig. 25); slowly let the lower limbs, with the entire column of the body in position, fall to the right and gradually descend over the arm until the feet come to the ground, the horse on the right (Fig. 26); descend yielding.

Fig. 25.

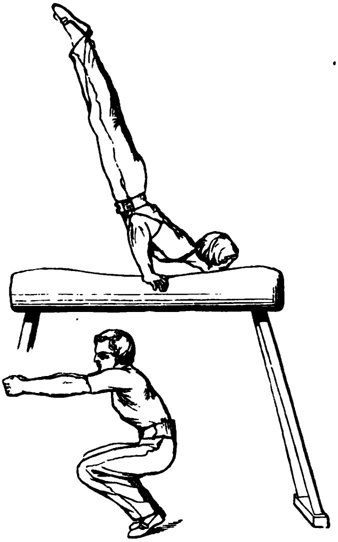


Fig. 26.

This exercise to be repeated on the left.

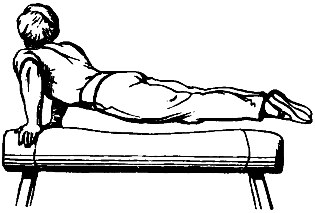
To vault over the horse.

EXERCISE 20.
COURSE I.

1. Preliminary run as before, quickening the pace to full speed; spring as in preceding exercise, passing the lower limbs in position over the horse to the right (Fig. 27), advance the right hand opposite the left, press strongly and descend yielding, facing the horse.

In this exercise the body should be thrown well forward in the spring, the feet should describe a semicircle, beginning at the point where they quit the ground, and finishing where they alight, the hands being the centre upon which the trunk and lower limbs turn; during this exercise, therefore, the chest should be continually turning towards the horse, the legs should be straight and together, the toes pointed, the whole body, when in the act of clearing the horse, forming one horizontal line over it.

Fig. 27.



This exercise to be repeated on the left.

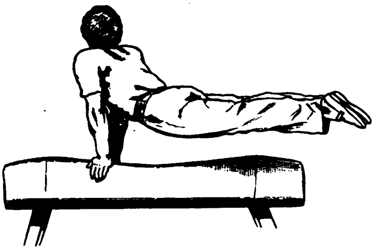
To vault over the horse.

The back hollow.

EXERCISE 21.
COURSE II.

1. Precisely as in the preceding exercise, except that immediately on the spring the back is curved inwards, the head and shoulders are held erect, the arms placed at full extension upon the horse, and this position maintained throughout the exercise

Fig. 28.



To vault on the horse resting on the knees.

EXERCISE 22.
COURSE I.

1. Preliminary run as before; spring straight to the front, the hands taking their place on the back of the horse immediately after the spring, bring both legs, with the knees closely bent up, between the arms and come to the rest on the knees, as in the same exercise without a run (Fig. 6), and descend as in Figs. 7 and 8.

To vault on the horse resting on the feet.

EXERCISE 23.
COURSE II.

1. As in the preceding exercise, except that the feet, instead of the knees, are placed on the saddle; straighten the legs, and complete the exercise, as from the standing position (Fig. 9).

To vault over the horse between the hands.

EXERCISE 24.
COURSE III.

1. Proceed as in vaulting to the stand on the feet, except that the legs are still more closely bent up, and the feet, instead of resting on the saddle, are shot through between the hands, as in the same exercise without a run (cf. Figs. 10, 11, 12); press from the hands as the feet clear the horse, and descend yielding.

To vault over the horse between the hands, the back hollow.

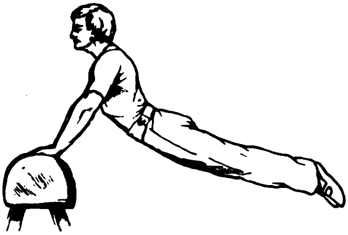


Fig. 29.

EXERCISE 25.
COURSE IV.

1. Proceed as before to the spring, at the moment of which the body is raised erect, the head and shoulders thrown slightly back, the back curved, the legs and feet kept well behind (Fig. 29); and by strong pressure of the hands the body is passed in this position over the horse.

To vault over the horse between the hands, showing a balance.

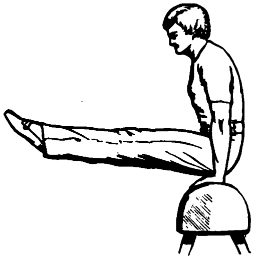


Fig. 30.

EXERCISE 26.
COURSE IV.

1. Proceed as in the ordinary vault between the hands till the position of Fig. 11 is reached; without pause shoot the feet forward, the arms at full extension, and retain the balance (Fig. 30). Press strongly with the hands away from the horse, let the legs and feet drop to the front, and descend yielding.

To vault over the horse, the legs astride.

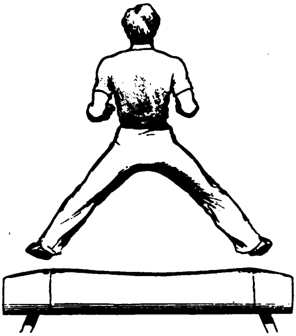
EXERCISE 27.
COURSE III.

1. Except for the run and method of spring, precisely as in the similar exercise from a standing position (Fig. 13).

To vault over the horse, the legs astride, the back hollow.

EXERCISE 28. COURSE IV. 1. As in the preceding exercise, except that so soon as the legs are above the horse at full extension, the back is immediately curved inwards, the head thrown back, and this position maintained whilst the legs close and the feet come to the ground.

Fig. 31.



To vault over the horse by the back lift.

EXERCISE 29. COURSE III. 1. Precisely as in the similar exercise from the standing position, except that the spring is made before the hands are placed on the horse. Cf. Figs. 14 and 15.

To vault the horse by the back lift.

The back hollow.

EXERCISE 30. COURSE IV. 1. Precisely as in the similar exercise from a standing position, except for the method of spring. The back must be curved inwards and the correct position assumed at the spring, so as to alight with the hands on the horse in that position and retain it throughout. Cf. Fig. 16.

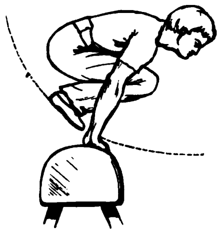
To vault over the horse between the hands, by the back lift.

The jump away from the balance.

EXERCISE 31.
COURSE IV.

1. Proceed as in the ordinary back lift, till the perpendicular position above the horse is reached (Fig. 16). Press strongly away from the horse with the hands, and rapidly rounding the back and bending the knees (Fig. 32), bring the feet smartly between the hands, at the same moment again hollowing the back, and descend yielding.

Fig. 32.



This exercise may be varied by pressing up to straight-arm balance (Fig. 18) before descending between the hands.

To vault over the horse by the back lift.

Resting on the forearm.

EXERCISE 32. COURSE IV.

This, together with the succeeding Exercises 33, 34, 35, does not differ from the similar ones from a standing position except that the spring is made from both feet, struck full and flat upon the ground, and that the hands are placed on the horse after the spring.

To vault over the horse by the back lift.

Showing the straight-arm balance.

EXERCISE 33. COURSE IV.

To vault over the horse by the back lift over one hand.

EXERCISE 34. COURSE IV.

To vault over the horse by the back lift and turn.

EXERCISE 35. COURSE IV.

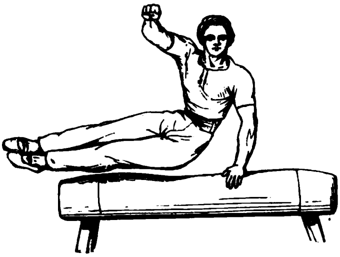
To vault over the horse with one hand.

Flank vault.

EXERCISE 36.
COURSE IV.

1. Proceed as usual to the spring; place both hands on the back of the horse, immediately release the grasp of the right hand, throw the right arm above the head, and pass the lower limbs in position over the horse (Fig. 33); lean forward when clearing the horse, press strongly with the left hand, and descend yielding, the horse on the left.

Fig. 33.



To vault over the horse with one hand.

Front vault.

EXERCISE 37.
COURSE IV.

1. Proceed as usual to the spring, place both hands on the horse; immediately quit the grasp of the right and throw the right arm above the head, completing the exercise as from the standing position (Fig. 22).

To vault over the horse with one hand.

Rear vault.

EXERCISE 38. COURSE IV. 1. Proceed as usual to the spring; place both hands on the horse, and immediately quitting the grasp of the right, complete the exercise as from a standing position (Fig. 23).

This exercise may be varied as described on page 115 (Fig. 24).

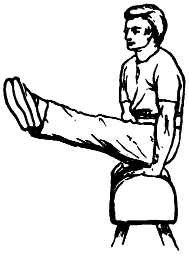
To vault over the horse with one hand, with complete turn.

EXERCISE 39. COURSE IV. 1. Proceed as usual to the spring, place both hands on the horse and immediately quit the grasp of the right. As the body passes over the horse the face and body are rapidly turned towards it, the left hand quits its grasp and, as the face and body again turn away from the horse, the right hand takes the place of the left, the body describing a complete turn towards the left, and the descent is made with the back to the horse.

To circle over the horse with both legs.

EXERCISE 40. COURSE IV. 1. Proceed as usual to the spring, and immediately on placing the hands on the horse elevate the lower limbs in position to the right, raise the head and shoulders erect, bringing the rear towards the horse; release the grasp of the right hand and pass the limbs in position (Fig. 34) beneath it, and continuing the circle movement pass them similarly beneath the left arm to the rear over the horse, and descend to the springboard, facing the horse.

Fig. 34.



Third Series.

Position of attention, 25 *or* 30 *feet from the horse, facing the croup.*

To vault to the croup.

EXERCISE 41. COURSE I.

1. Slowly begin the run, quickening the pace on the advance, and when within 2 or 3 feet of the croup, spring from both feet, immediately placing the hands on the croup, right and left; fully separate the lower limbs during the rise, and as the body reaches the croup advance the hands 6 or 8 inches along the back of the horse, and lightly sink to the seat on the croup (Fig. 35); the head and column of the body slightly inclined to the front, the lower limbs straight, the toes pointed to the front.

Fig 35.

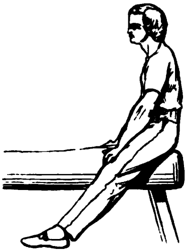
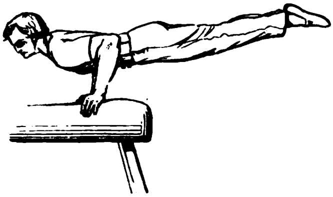


Fig. 36.



In descending, incline the head and trunk to the horizontal line of the horse, elevate the lower limbs, straight and together, until they are in a line with the body (Fig. 36), shoot them out far to the rear, at the same time pressing from the hands, and descend yielding, facing the croup.

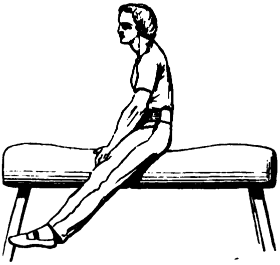
To vault to the saddle.

EXERCISE 42. COURSE II.

1. As in preceding exercise, until the lower limbs rise above the croup, but instead of allowing them to rest, continue the momentum of the spring, rapidly advance both hands to the saddle and lightly sink to the seat, place the hands on the thighs, the head erect, the breast advanced, as in Fig. 3.

In descending, replace the hands on the horse (Fig. 37), elevate the lower limbs, and descend as in the ordinary vault on the horse (Figs. 25 and 26).

Fig 37



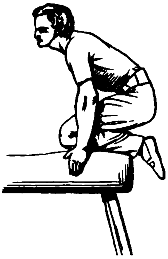
To vault to the croup resting on the knees.

EXERCISE 43. COURSE I.

1. Proceed as before to the spring; bring both legs, with the knees closely bent, up between the arms, and let them lightly rest on the croup between the hands (Fig. 38).

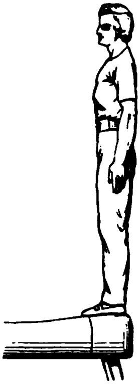
In descending, incline the head and trunk of the body to the front, slowly elevate the lower limbs, and shoot them to the rear, as in Fig. 36, and descend yielding.

Fig. 38.



To vault to the croup, resting on the feet.

Fig. 39.



EXERCISE 44.
COURSE II.

1. As in preceding exercise, except that the knees are lifted above the croup as high as the breast, and the soles of the feet placed on the horse; straighten the legs, rising from the palms to the tips of the fingers, and stand upright on the croup (Fig. 39).

In descending, re-bend the knees, spring backwards, and descend yielding, facing the croup.

To vault to the croup, the legs on the right.

EXERCISE 45.
COURSE II.

1. Proceed as usual to the spring, but instead of separating the lower limbs, keep them together, and during the rise to the croup, pass them to the right, and slowly sink to the side-seat on the croup (Fig. 40).

Fig. 40.

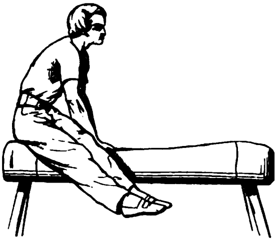
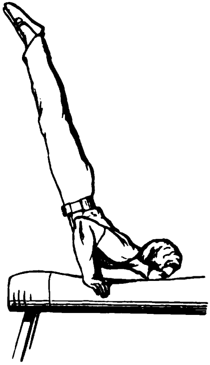


Fig. 41.



In descending, incline the head and shoulders to the front, press strongly from the hands, elevate the lower limbs over the horse until they are above the head (Fig. 41), slowly let the lower limbs, with the entire column of the body, fall to the left, and gradually descend over the arm, until the feet come to the ground, the horse on the left.

This exercise to be repeated on the left, descending on the right.

To vault over the croup, the legs passing from right to left.

EXERCISE 46.
COURSE III.

1. As in preceding exercise, until the rise above the croup, but instead of allowing the legs to rest upon it, continue the momentum of the spring, lifting the right hand, and extending it rapidly above the head, and carry the limbs forward and upward over the horse in front (Fig. 42), and turning completely round upon the left hand, descend yielding, facing the line of the horse, the horse on the left (Fig. 43).

Fig. 42.

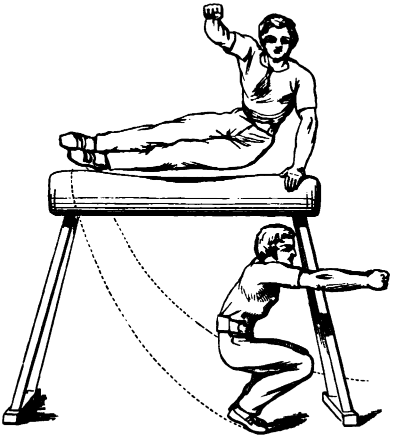


Fig. 43.

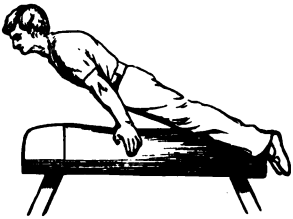
This exercise to be repeated, the legs passing from left to right.

To vault over the horse by the croup, the legs astride.

EXERCISE 47.
COURSE III.

1. As in previous exercises of the Third Series, except that the pace is quickened to full speed. Immediately after the spring fully separate the lower limbs, the legs straight, toes pointed, the head and column of the body inclined slightly forward, the hands placed well forward on the neck of the horse, the arms at full extension (Fig. 44). Press firmly with the hands and bring the legs together in front of the neck of the horse, passing the body over it, and descend yielding.

Fig. 44.



To vault over the horse by the croup, the legs astride.

A Second Method.

EXERCISE 48.
COURSE III.

1. This exercise is identical with the preceding, except that the hands are placed first on the croup, and then shifted together on to the neck of the horse as the body passes over it, in one continuous movement.

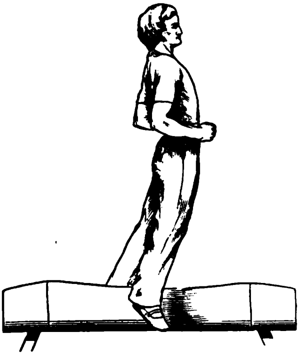
To vault over the horse by the croup, the legs astride.

A Third Method, the back hollow.

EXERCISE 49.
COURSE IV.

1. As in previous exercises of the third series, except that the pace is quickened to the utmost, the hands are placed on the horse midway between the croup and the saddle, and by strong pressure the trunk is elevated considerably above the horse, the back being curved inwards (Fig. 45), and the hollow-back position maintained from the spring till the descent to the ground.

Fig. 45.



To vault over the horse by the croup, the legs astride.

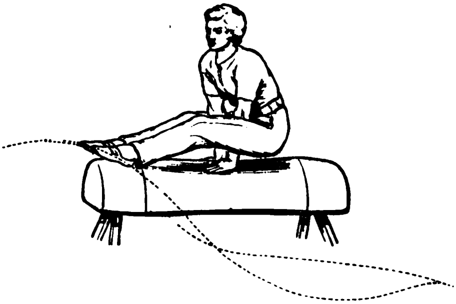
A Fourth Method.

EXERCISE 50.
COURSE III.

1. Proceed as before to the spring, but let the hands be placed well forward on the saddle of the horse. Fully separate the lower limbs during the rise, keeping the head and column of the body well inclined to the front, the legs straight,

the toes pointed; elevate the legs rapidly in front of the hands, meantime bringing them together till the feet touch (Fig. 46), and at the same moment pressing strongly with the hands, shoot the body over the neck of the horse and descend yielding.

Fig. 46.



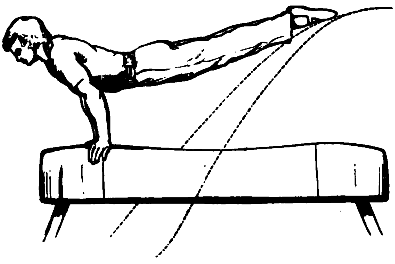
To vault over the horse by the croup, the legs astride.

A Fifth Method.

EXERCISE 51.
COURSE IV.

1. Proceed as usual to the spring, quickening the speed of the run to the utmost; immediately on the spring the lower limbs should be elevated to the rear, the back curved inwards, the head erect and thrown slightly back, the legs being kept straight and well together, the hands placed one on each side of the neck of the horse very forward (Fig. 47). From this position the legs, still

Fig. 47.



straight, are fully opened and pass one on each side of the neck whilst the head and trunk are elevated, the legs gradually closing, and meeting when the ground is reached.

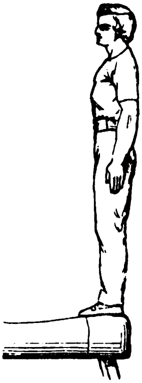
To vault over the horse by the croup through the hands, in two movements.

EXERCISE 52.
COURSE III.

1. Come to the stand upright upon the croup, as above described (Fig. 48).

2. This position is only momentary. Spring forward and place the hands one on each side of the neck of the horse, the arms at full extension, at the same time elevating the lower limbs in the rear. Bring the knees quickly to the chest and shoot the legs through the hands, inclining the head and trunk upwards; and pressing firmly with the hands, descend yielding to the ground.

Fig. 48.

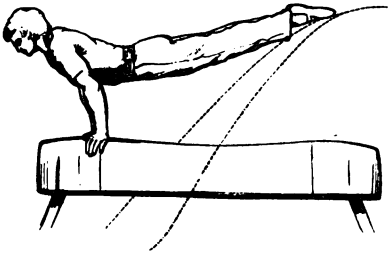


To vault over the horse by the croup through the hands.

EXERCISE 53.
COURSE IV.

1. Immediately on the spring elevate the lower limbs to the rear, carry the hands well forward, placing them one each side of the neck (Fig. 49), when without pause the knees are quickly brought to the chest, the legs shot through the arms, and the descent made as in the preceding exercise.

Fig. 49.



To vault over the horse by the croup, by the back lift.

EXERCISE 54. COURSE IV. 1. Proceed as in the preceding exercise till the position shown in Fig. 49 is reached, when the head and shoulders are depressed, the arms bent and the lower limbs passed over the head as described in the ordinary back lift. Cf. Figs. 16 and 15.

This exercise may be varied by retaining the straight-arm balance, instead of bending the arms, or by pressing up to the straight-arm balance previously to descending to the ground.

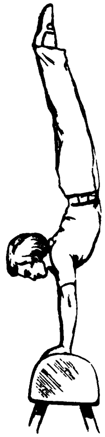
APPENDIX TO THE VAULTING HORSE.

Second Series.

The inverted vault over the horse.

EXERCISE 55. 1. As in previous exercises of the second series to the spring. Striking the feet full and flat upon the board, spring high above the horse, quickly invert the body and light upon the back of the horse with the arms at full extension in position, the back curved inwards (Fig. 50). Without pause continue the movement, bending the arms and letting the lower limbs sweep over the body, and descend yielding.

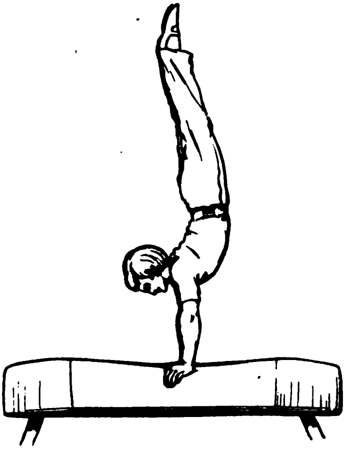
Fig. 50.



The inverted side vault over the horse.

EXERCISE 56. 1. As in the previous exercise to the spring. Striking the feet full and flat upon the ground, spring high above the horse; quickly invert the body, turning the left side round in so doing, and light upon the back of the horse with the arms at full extension in position (Fig. 51). Without pause let the lower limbs sweep over the horse and descend yielding, facing the horse.

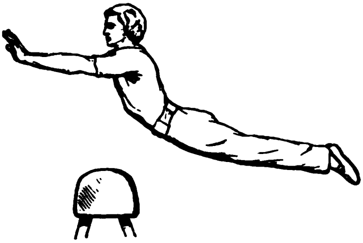
Fig. 51.



To fly over the horse, the back hollow.

EXERCISE 57. 1. This exercise differs from all others in that the horse is not touched by any part of the body. Quicken the pace of the run to t

Fig. 52.



utmost, spring, and on leaping from the board curve the back, holding the head and shoulders erect and slightly back, the feet and legs being somewhat behind the rest of the body, both arms advanced at full extension (Fig. 52), and in this position clear the horse, the hands alighting on the shoulders of the instructor, who must stand facing, and a pace or two away from, the horse. Descend from this position yielding.

To rise upon the horse by the leg circle and roll off.

EXERCISE 58. 1. Proceed as in the ordinary vault on the horse (Exercise 1) till above it, but instead of bringing the right leg to the position astride, carry it round and over the horse (Fig. 53), at the same time shifting the right hand and passing the limb beneath it, till the sitting position is reached with the back to the horse. Elevate the hands above the head (Fig. 54) and incline the body quickly backwards till the small of the back strikes the horse, rapidly elevate the lower limbs and pass them in position over the head, and descend yielding.

Fig. 53.

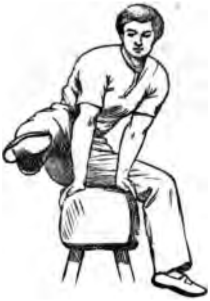
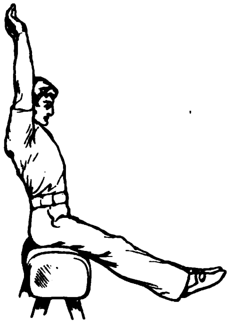


Fig. 54



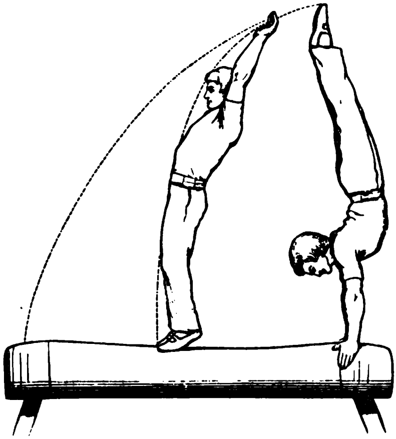
This exercise to be repeated with circling of the left leg.

Third Series.

To vault the horse by the croup, by the back lift and handspring.

EXERCISE 59. 1. Proceed as in the other exercises of the third series to the spring, placing the hands one on each side of the croup. Depress the head and shoulders, and, elevating the lower limbs by the rear, continue the sweep as in Fig. 16, and descend on to the horse yielding, the arms elevated above the head slightly backwards, palms facing outwards (Fig. 55).

Fig. 55. Fig. 56.



2. The position is only momentary. Incline the head and trunk downwards, place the hands one on each side of the horse and, bending the arms once more, sweep the lower limbs in position upwards and over the body and descend yielding to the ground.

The exercise may be varied by showing the straight-arm balance as in Fig. 56; thence bending the arms and continuing the exercise as in the ordinary back lift.

To vault the horse by the croup, by the back lift and forward roll.

EXERCISE 60. 1. Proceed as usual to the spring; place the hands on the croup and, elevating the lower limbs by the rear, continue the sweep over the head as in the previous exercise, but instead of coming to the standing position on the horse, part the lower limbs and let them gradually descend to the seat astride the horse, the arms remaining elevated above, the palms facing outwards.

2. Without further pause place the hands on the neck, depress the head and shoulders and, allowing the right shoulder to rest on the left side of the horse, again let the limbs rise over the head and descend in position to the ground.

TURNS.

It is obvious that by means of turning the body unending variations may be given to the exercises described in the System. As forms of recreative amusement they are worth practising, and also, in some cases, they are valuable as giving agility to the body; in a few instances, therefore, exercises with turns have been introduced into the System. It must be understood, however, that the exercises of the System are described in their standard manner, and that there is no harm, but rather gain, in the addition of such turns at the discretion of the instructor. In the case of growing boys turns should always be avoided, and especially what are sometimes termed 'screw turns,' and turns of the legs, where they cross one another. Turns consist of quarter turns, half turns, and complete turns; the first, where the body is turned from the front to the right or left; the half turn, where the move is from front face to right-about-face; the complete turn, where the body moves round till it reaches its original position. A few instances of these will suffice. In the ordinary two-handed vault over the horse by the right, if the pupil alights with the left side to the horse he has described a quarter turn left; if facing the horse, a half turn left; if after facing the horse, he again turns his back to it and alights facing the same way as he started, he has described a complete turn.

Another form of turning, the tricky nature of which is best shown by its name of scissors or shears, and which is more naturally adapted to horses with pommels, is that of bringing the body round by passing the legs the one beneath the other in their opposite directions. Thus it is obvious that from the rest upon the arms astride the horse, by passing the right leg by the rear over the horse to the left and the left leg over the horse to the right beneath the right leg, and letting go with the hands, the pupil will turn to the right and eventually come to the seat astride the horse facing the other way. Similarly by passing the right leg to the left, and the left leg to the right but *over* the right leg, he will come to a similar position by means of a left turn. This method of turn can be employed in mounts to the horse, and in changes of position on the horse itself.

Numerous exercises can also of course be created by changes of seat and changes of position by means of vaults and turns from one part of the horse to the other, or from the horse to the ground, but a catalogue of them is mere repetition, and any gymnast worthy the name can devise such for himself.

POMMEL EXERCISES.

By having pommels fitted to the horse the power of the grasp is materially increased, and a greater elevation obtained over the horse. This addition is specially used in the German style of gymnastics, and admits of a variety of tricky exercises above the horse with the legs which would be difficult and ungraceful, where not impossible, if performed with the ordinary leather saddle. As in the case of the Horizontal Bar and the Parallel Bars it may be said that such exercises are practically unlimited, and any exhaustive list of them would be valueless, even if possible, because the gymnast is quite fitted to create these for himself by the time that he has passed through the apprenticeship of the more valuable exercises, and so reached the point at which they are likely to be of benefit to him. It will be useful, however, to point out here the main directions in which exercises may be followed out with the help of the pommels. These should be one on each side of the saddle and covered with leather in the shape of a semicircular bar, broad enough for the grasp of the hand, and should be raised from 4 to 5 inches above the horse in their widest part.

CIRCLING.

Circles and half circles admit of being performed from the three forms of rest, viz. the forward rest, the back rest, or the rest on the top of the horse. In the case of the forward rest and the back rest the pommels enable the gymnast to keep the thighs in position away from the horse; permitting, in the case of one-leg circles, the circling leg to pass beneath the other; this position is sometimes termed Free Rest. In the rest on the top of the horse the legs are held straight to the front in horizontal position, either between the hands, outside the hands, or one leg inside the hands.

From these positions the circle takes place either of left leg, right leg, or both legs, and this either to the right or the left, the legs passing completely over the horse and the hands being raised to allow the leg or legs to pass beneath them without the leg at any period of the circle touching the horse; both arms must be held quite straight and the circling leg or legs kept close together and stiff, the toes pointed to the front. In the case of circling with one leg, forwards or backwards, the circling leg of course passes between the other and the horse.

The most difficult and most effective of all these exercises are the continuous circles either of one leg or of both legs, in which the circling leg or legs never touch the horse.

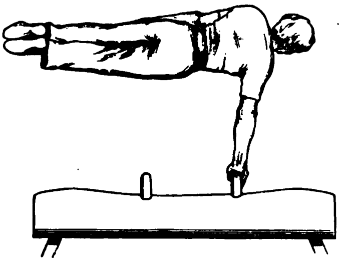
FEINTS.

Feints are scarcely so much exercises in themselves as movements preparatory to other exercises, as the term itself seems to imply. If, in the vault to the seat astride, the movement is arrested before the legs come to the position on the horse, and the body is supported on the arms with either the left or right leg over the further side of the horse, accordingly as the vault is either by the left or right, this is termed a left or right feint. The arms must be straight and the legs stiff, toes pointed outwards. Similarly, if in the vault over the horse by the left or right the legs, instead of being passed over the horse to the ground, are brought round so as to touch the left and right arm respectively, this is termed a double feint. In this case the head and shoulders are well elevated, as the arms are kept straight throughout, and the legs are straight and together. From the feints various exercises are performed, the most natural being vaults to the opposite side to that on which the feint is made.

VAULTS.

By the help of the pommels the ordinary one-handed vaults over the horse may be performed with a hollow back and straight arms. The aim should be to have the trunk and lower limbs in horizontal position parallel with the horse, the supporting arm being at full extension (Fig. 57). With this exception and that of the back being straight or curved inwards rather than rounded, the exercises are similar in spring and in method to Exercises 36–38 described in the System.

Fig. 57.



By means of the pommels it is possible to spring to the position of the straight line on the horse and retain the balance, owing to the additional grasp. The position is in every way similar to that shown in Fig. 30 of the Parallel Bars. The vault through the hands is thus very often performed with a spring to the straight line; from this position the back is rounded and the legs shot through to the front as in the similar exercise (7) described in the System.

THE PARALLEL BARS.

With the Parallel Bars we leave behind that section of apparatus, which deals with exercises of progression and comprises the beam, the vaulting bar, and the vaulting horse; and we proceed to another section by means of which the instructor is enabled, in accordance with the law that the physical development of any part of the body shall be in relation to its activity, to reach any part that may be in special need, and bring it to the standard of the rest of the body, and also to cultivate the entire physical resources of the learner to their highest attainable point; and specially to give a full share of employment to the trunk and upper limbs. In a large portion of these exercises the lower limbs act but a secondary part, the effort required being made chiefly by the trunk and the arms.

The apparatus of this section is the very heart of the gymnasium proper, indeed more than one of the machines (as the parallel bars, the trapezium, &c.) is virtually a gymnasium in itself when in the hands of a skilful instructor; for there is scarcely a part of the body which its exercises do not reach; while there is scarcely any exercise in its extended range which may not be modified to meet the first essay of the weakest or most timid beginner, and yet when executed in its perfect manner, is not capable of testing and increasing the strength and dexterity of the most practised gymnast. From their great variety and peculiarly interesting nature they are invariably favourites with learners in every stage of advancement.

The parallel bars are invaluable in a gymnasium, the exercises being not only numerous, but varied, interesting, and in themselves pleasurable, capable of much artistic effect, and requiring equally muscular power and dexterity of action in trunk and limb. Again, the exercises themselves require no violent or sudden effort; all the movements flow from one point to another, and the skill displayed in their execution and the advantage obtained from their practice lie in the certainty, steadiness, and regularity with which the complex action of the step is performed.

In order to suit the requirements of the System all the less advanced exercises are described first in their simpler form, giving what is termed the 'round back' position; this, of recent years, has yielded in favour to the so-called 'hollow-back' position, and rightly so; for the latter demands not merely the employment of the muscles of the arms and upper part of the trunk, but brings prominently into action also the muscles of the back and abdomen and lower limbs. It is not, however, by any means so well suited to beginners, and it will be found advisable for all such and for young pupils to content themselves with the ordinary and less stiff positions till they are thoroughly acquired, before proceeding to the hollow-back ones. These latter are also described after the others in their place. It must be borne in mind that there are three points essential to the correct performance of hollow-back exercises, firstly, perfect rigidity of the lower limbs without relaxation when they rest upon the bar; secondly, absolute straightness of the arms; and thirdly, the retaining of the curve inwards of the trunk and lower limbs in all cases where this is not impossible (as, of course, when the lower limbs are elevated forwards to the level of the bars).

In exercises involving the horizontal position of the trunk and limbs above the bars we have held to the old-fashioned nomenclature and described the position as 'the straight line,' rather than adopt one of the modern terms such as 'planches' and 'levers,' which have found their way into gymnastics from the acrobatic world. At the same time it is obvious that the term 'straight line' does not apply so exactly to the modern hollow-back style, which requires a slight curve of the whole column of the body, as to the old style in which the head, trunk, and lower limbs formed one perfect line. The latter less strained position is, as we have before observed, the more natural one for learners, the hollow back being reserved till the pupil is a more or less capable gymnast.

All exercises on this machine are virtually executed by the trunk and upper limbs, especially the former; they naturally divide themselves into three series:—The first comprises those which consist of *travelling* along the bars, following the natural shape and construction of the machine, to front or rear, single or double handed; the second, those of *oscillation* between the bars, in which the exercises may be said to consist of an evolution more or less complicated, passing from front to rear, or vice versa, between two points, of which the hand-grasp forms, as it were, the pivot or centre. This is a most valuable and attractive series, giving abundant and varied exercise to the entire column of the body, and to the arms whether bent or extended. The third series is a *combination* of these two, also valuable, as strongly addressing the trunk of the body.

Every exercise is here given in its perfect form, but with beginners of ordinary physical capacity, they may and should be approached through several stages of less difficulty. Thus, in those of the first series, the perfectly upright position of body, advanced breast, straight limbs, and erect head, may be departed from in the earlier stages of practice. Also, a free lateral inclination from hand to hand, and, in the front and rear exercises, with both hands at once, a more energetic upright lift of the lower limbs, may be allowed.

The second series may be approached, first, by beginning with the feet between the uprights, near the entrance to the bars, with or without a spring, as may be required; second, from the centre of the bars under the hands and from the ground direct, with or without a spring; third, as given in the text, with the feet free from the ground, in the position of the Rest, the action coming from the loins, resting entirely on the hands.

The exercises in this series, viz. Exercises 17 to 46, are considered sufficient for the purposes of the System, containing, as they do, the essential characteristics of all oscillating exercises on the parallel bars. At the same time they may be varied, almost *ad infinitum*, with different positions when sitting on or astride the bar or bars; with crossing of the legs; with kneeling and standing on the bars, or again, with different turns of the body in mounting to the bars; or, as a variation, one hand only may be used in the vaulting of the bar in many exercises. These variations, of little or no further value to the physical growth of the body, are agreeable in themselves and may be left to the discretion of the gymnast himself, when he has mastered the exercises set forth in the System.

A point demanding very careful observance is, that the learner shall never separate his legs while executing the exercises of the second series here given; they must be kept rigidly in position, and this principle must be firmly inculcated from the first day's lesson.

The parallel bars should be about 8 feet long, 18 inches apart inside, on uprights which can be moved up or down so as to adjust the bars to the height required. The bars themselves should be rounded to fit the hands.

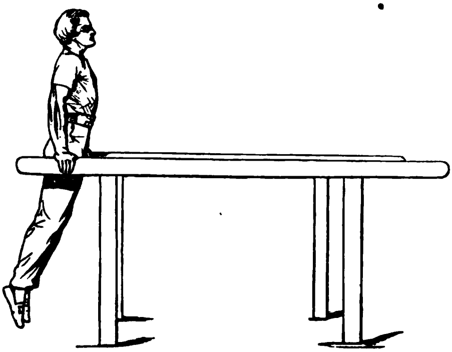
FIRST SERIES . . .	*Travelling.*
SECOND SERIES . . .	*Oscillating.*
THIRD SERIES . . .	*Combinations.*

Preliminary Movements.

To come to the rest between the bars.

COURSE I. Raise the hands and place them on the bars, the thumbs inside, the fingers outside, extended, and pointed downwards; press from the hands until the arms are completely extended, the head upright, the eyes directed to the front, the chest advanced, the shoulders square to the front, the column of the body upright

Fig. 1.



and firm, the lower limbs straight and together, the feet together and pointed to the ground (Fig. 1).

To come to the rest between the bars by the slow rise.

COURSE III. 1. Place both hands upon the ends of the bars, the palms on the top of the bars, the thumbs inside, lower the body to the reach of the hands and pass both feet to the front till they are at right angles to the trunk, the legs together and straight, the feet together, the toes pointed to the front.

2. Pulling strongly from the hands and wrists raise the body through and above the bars, the elbows pressed well in towards the side, the lower limbs gradually falling to the rear as the arms bend and the body is raised (Figs. 2 and 3). Pressing strongly upon the wrists slowly straighten the arms, the lower limbs having meantime fallen back into the perpendicular line with the body, and thus come to the position of the Rest.

Fig. 2.

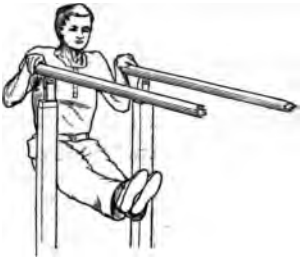
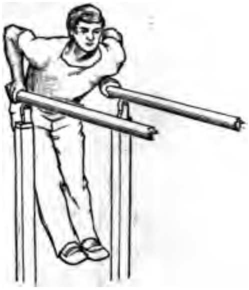


Fig. 3.



For the '*cut in*,' '*vault in*,' and other methods of coming to the Rest, vide the Appendix to the Parallel Bars.

First Series.

Position of attention at the entrance to the bars, the front or back to the bars.

The single march forwards.

EXERCISE 1.
COURSE I.

1. Come to the Rest between the bars by the first method.

2. Rest on the left hand, advance the right 6 inches beyond it along the bar, advance the left 6 inches beyond the right. Repeat.

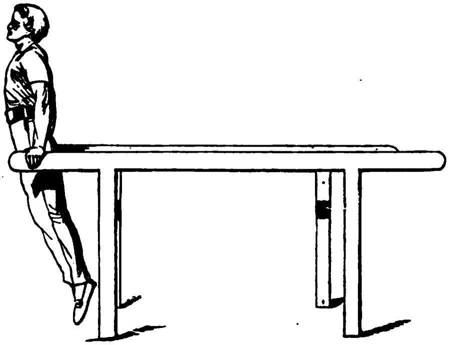
The single march backwards.

EXERCISE 2.
COURSE I.

1. Come to the Backward Rest between the bars (Fig. 4).

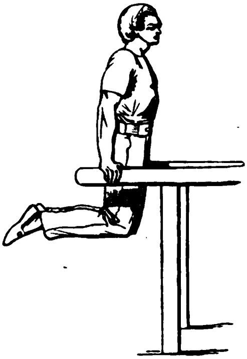
2. Rest on the left hand and advance the right 6 inches to the rear, the left following on the left bar, as in the previous exercise. Repeat.

Fig. 4.



The double march forwards.

Fig. 5.



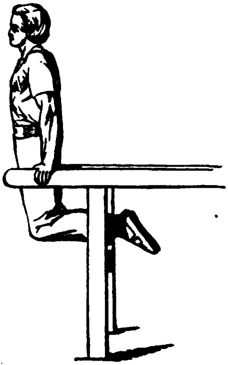
EXERCISE 3.
COURSE II.

1. Come to the Rest between the bars; bend the lower limbs at the knee at a right angle with the body, the toes pointed to the rear (Fig. 5).

2. Spring forward with both hands, 6 inches along the bars, retaining the body and lower limbs in position. Repeat.

The double march backwards.

Fig. 6.



EXERCISE 4.
COURSE II.

1. Come to the Backward Rest between the bars and bend the legs at the knees at a right angle with the body (Fig. 6).

2. Spring backwards with both hands 6 inches along the bars, retaining the body and lower limbs in position. Repeat.

The single march forwards.

The arms bent.

EXERCISE 5. COURSE II.

This exercise, together with the succeeding ones, 6, 7, 8, are similar to the four previous ones respectively, with the exception that after coming to the Rest upon the bars, the arms are gradually re-bent and this position maintained throughout the exercise.

The single march backwards.

The arms bent.

EXERCISE 6. COURSE II.

The double march forwards.

The arms bent.

EXERCISE 7. COURSE II.

The double march backwards.

The arms bent.

EXERCISE 8. COURSE II.

The single march forwards, the arms bent.

Rising to the Rest.

EXERCISE 9.
COURSE III.

1. Come to the Rest between the bars, and sink to the bent-arm position.

2. Quitting the grasp, incline the weight of the body on the right arm, pass the left arm to the rear, extend it and pass it by the side to the front and re-grasp the bar in front at the full reach, rising to the Rest on both arms; lean the weight of the body on the left arm, turning the back towards the bar, and slowly re-bending the left arm quit the grasp of the right hand, and advance the right arm to the full reach. Rise to the Rest. Repeat.

The single march backwards, the arms bent.

Rising to the Rest.

EXERCISE 10.
COURSE III.

1. Come to the Bent-Arm Rest as above.
2. Inclining the weight over the right arm, quit the grasp of the left hand, and bring it by the side outside the bar to the rear, grasping the bar 6 inches in advance of the right. Rise to the Rest; inclining the weight over the left arm, and sinking again to the bent-arm position, repeat with the right arm.

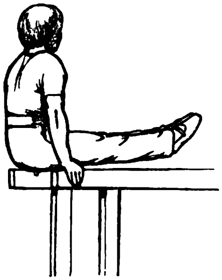
The single march forwards.

The legs up.

EXERCISE 11.
COURSE III.

1. Come to the Rest between the bars; without bending the arms elevate the lower limbs forward till they are in a horizontal position parallel with the bars, the legs straight and together, the feet together, the toes pointed to the front, the trunk of the body upright (Fig. 7).

Fig. 7.



2. Rest on the left hand, lean slightly backwards, advance the right 6 inches beyond it along the bar, advance the left 6 inches beyond the right. Repeat.

The single march backwards.

The legs up.

EXERCISE 12. COURSE III. 1. Come to the Backward Rest between the bars, and elevate the lower limbs as in the preceding exercise.

2. Rest on the left hand, lean slightly backwards, advance the right 6 inches beyond the left along the bar and repeat with the left, as previously.

The double march forwards.

The legs up.

EXERCISE 13. COURSE IV. 1. Come to the Forward Rest on the bars and elevate the lower limbs as before (Fig. 7).

2. Spring forward 6 inches along the bar with both hands, leaning slightly backwards and retaining the body and limbs in position. Repeat.

The double march backwards.

The legs up.

EXERCISE 14. COURSE IV. 1. Come to the Backward Rest and elevate the lower limbs as before.

2. Spring backwards 6 inches along the bar with both hands, leaning slightly backwards and retaining the body and limbs in position.

To circle in the rest.

EXERCISE 15. COURSE III. 1. Come to the Rest between the bars.

2. Incline the head and shoulders to the left side, so as to support the body as much as possible upon the left arm, and releasing the grasp of the right hand turn the body round towards the left bar; grasp the bar with the right hand and rest on both hands. Release

the grasp of the left hand and turn the body gradually backwards towards the left, meantime inclining the body well over the right arm; grasp the (originally) right bar with the left hand. Release the grasp of the right hand and, again gradually turning the body, grasp the single bar with both hands; now release the grasp of the left hand, and, turning the body, grasp the left bar with the left hand, taking up the original position of the Front Rest between the bars. Repeat.

To circle in the rest.

The arms bent.

EXERCISE 16.
COURSE IV.

1. and 2. As in the preceding exercise, with the exception that after coming to the Rest on the bars, the arms are gradually re-bent and this position maintained throughout the exercise.

Second Series.

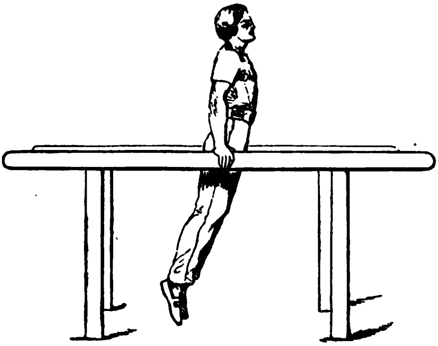
Position of attention, between the bars.

To clear the bar by the front.

EXERCISE 17.
COURSE I.

1. Come to the Rest between the bars in the centre of the bars (Fig. 8).

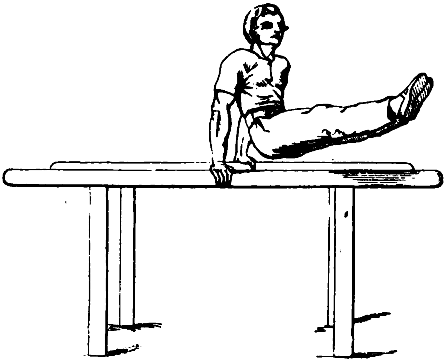
Fig. 8.



2. Elevate the lower limbs in position, the toes pointed

to the front, until they rise above the level of the bars, and pass them over the right bar (Fig. 9); press strongly from the left hand, spring to the ground, and descend yielding.

Fig. 9

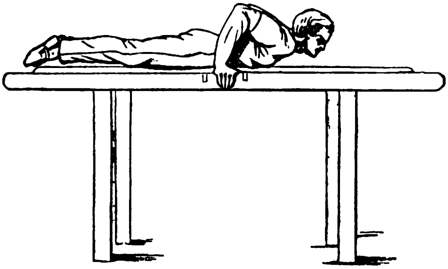


This exercise to be repeated, clearing the left bar.

To clear the bar by the rear.

EXERCISE 18. COURSE I. 1. Come to the Rest between the bars.

Fig. 10.



2. Elevate the lower limbs to the front, as in preceding exercise, and on their return oscillation to the rear incline the head and shoulders to the front, bending the arms, and elevate the lower limbs, the toes pointed to the rear, until they rise above the level of the bars, and pass them over the right bar ; (at

this point the lower limbs, trunk and head, are in the horizontal line of the bars, Fig. 10), press strongly from the left hand, clear the right bar, spring to the ground, and descend yielding, facing the bars.

This exercise to be repeated, clearing the left bar.

To clear the bar by the rear.

A Second Method.

EXERCISE 19.
COURSE II.

1. Come to the Rest between the bars.

2. Slowly incline the head and shoulders to the front, without swing, bending the arms, elevating the lower limbs to the rear, and clearing the bar, as in preceding exercise.

This exercise to be repeated, clearing the left bar.

To clear the bar by the rear.

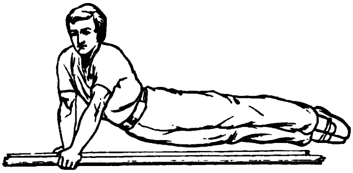
The back hollow.

EXERCISE 20.
COURSE II.

1. Come to the Rest between the bars as before described, but in pressing on the hands so as to rise above the bars, hold the head and shoulders well back, curving the back inwards and keeping the lower limbs and feet slightly to the rear.

2. Proceed with either of the methods of clearing the bar by the rear as above described, except that as the lower limbs fall to the rear in the return oscillation, the back is again curved inwards and the head and shoulders inclined backwards, the arms being kept at full extension, and this position retained throughout the exercise (Fig. 11).

Fig. 11.



To rest on the left bar and clear the right, by the front.

EXERCISE 21.
COURSE I.

1. Come to the Rest between the bars.

2. Elevate the lower limbs in position to the front until they rise above the level of the bars, pass them over and let them rest on the left bar, relaxing the extension (Fig. 12).

Fig. 12.

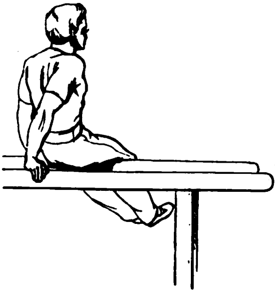
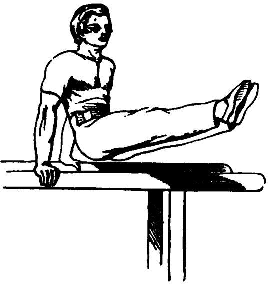


Fig. 13.



3. Press strongly with the hands, elevate the lower limbs in position above the bar, sweep them across and clear both bars to the right front (Fig. 13), and descend yielding, facing the line of the bars.

This exercise to be repeated, resting on the right bar, and clearing the left.

To rest on the left bar and clear the right, by the rear.

EXERCISE 22.
COURSE I.

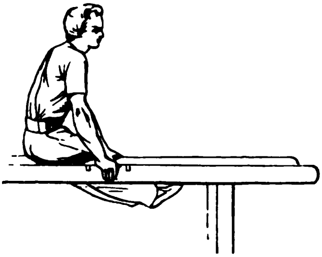
1. Come to the Rest between the bars.

2. Slowly incline the head and shoulders to the front; elevate the lower limbs, the toes pointed to the rear, until they rise above the level of

the bars, as in Fig. 10 or 11; at this point pass them over and let them rest on the left bar, the feet together, the toes pointed downwards (Fig. 14).

3. Incline the head and shoulders to the front, and at the

Fig. 14.



same time elevate the lower limbs in position, sweep them across both bars to the left rear, and descend yielding.

This exercise to be repeated, resting on the right bar and clearing the left.

To rest on the right bar in front and clear it by the rear.

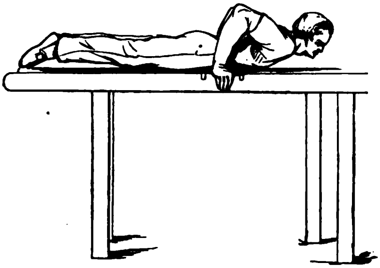
EXERCISE 23. COURSE I.

1. Come to the Rest between the bars.

2. Elevate the lower limbs in position to the front, until they rise above the level of the bars, pass them over and let them rest on the right bar (cf. Fig. 12); press strongly with the hands, elevate the lower limbs in position above the bar, pass them between the bars, and let them swing to the rear, at the same time bending the arms until the shoulders are as low as the bars, and bringing the column of the

body with the lower limbs to the horizontal line of the bars (Fig. 15), clear the right bar by the rear and descend yielding, facing the bars.

Fig. 15.



This exercise to be repeated on the left bar.

The same exercise to be repeated with the following variations:—

1. Resting on the right bar in the front and clearing the left by the rear.

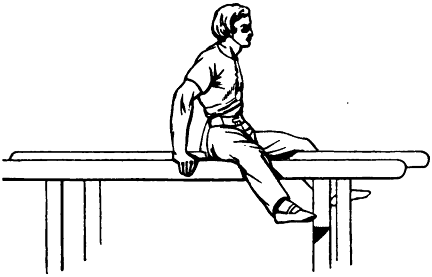
2. Resting on the left bar in the front and clearing the right by the rear.

To rest on both bars in front, and clear the right by the rear.

EXERCISE 24.

COURSE I.

Fig. 16.



1. Come to the Rest between the bars.

2. Elevate the lower limbs in position, the toes pointed to the front, until they rise above the level of the bars; at this point separate the lower

limbs and let them fall till they rest on the bars (Fig. 16); re-elevate them above the bars, let them sweep to the rear, clear the right bar, and descend yielding.

This exercise to be repeated, clearing the left bar.

To rest on the left bar in the rear, and clear it by the front.

EXERCISE 25. 1. Come to the Rest between the bars.
COURSE II. 2. Proceed as before till the lower limbs rest on the left bar in the rear (Fig. 14); incline the head and shoulders to the front, bend the arms until the shoulders are as low as the bars, the head between them, re-elevate the lower limbs in position, passing them between the bars, let them sweep to the front and clear the left bar (cf. Fig. 13), and descend yielding. During the last movement bring the head and shoulders to the vertical position, gradually straighten the arms and retain them straight while the feet clear the bar.

This exercise to be repeated on the right bar.

The same exercise to be repeated with the following variations:—

1. Resting on the left bar in the rear, and clearing the right in the front.

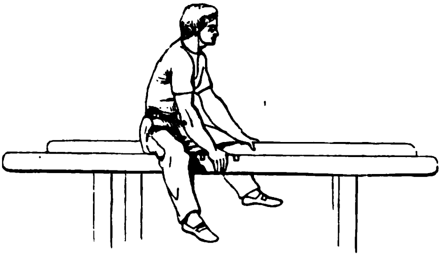
2. Resting on the right bar in the rear, and clearing the left by the front.

To rest on both bars in the rear, and clear the right bar by the front.

EXERCISE 26. 1. Come to the Rest between the bars.
COURSE II. 2. Slowly incline the head and shoulders to the front, bending the arms, elevate the lower limbs to the rear, until they rise above the level of

the bars, fully separate them and let them fall till they rest on the bars (Fig. 17); incline the head and shoulders to the front, re-elevate the lower limbs, and as they sweep to the front in position, let them clear the right bar, and descend yielding.

Fig. 17.



This exercise to be repeated, clearing the left bar.

To rest on and clear the bar, or bars, the back hollow.

EXERCISES 21–26. COURSE III. The above exercises of the second series permit of being performed with the back hollow. In each case the freer and more natural positions should be first acquired, and the stiffer hollow back positions learned later in Course III.

Fig. 18.

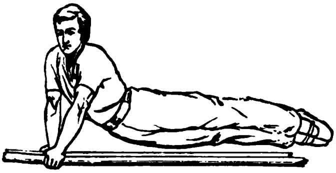
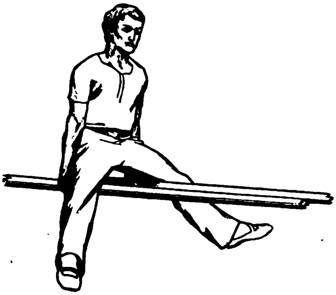
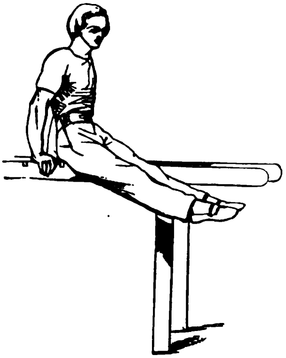


Fig. 19.



In each exercise the back must be curved inwards immediately on pressing upon the hands, so as to rise to the Rest. In all rearward oscillations this position must be maintained, as in Fig. 18; and in all cases, where the lower limbs rest upon the bar or bars, the extension of the legs is not relaxed as in the exercises already described, but they are retained straight with the feet pointed downwards to the front, as shown in Figs. 19 and 20.

Fig. 20.



To pass by the rear by the single swing.

The short-arm balance.

EXERCISE 27. COURSE III.

1. Come to the Rest between the bars.
2. Elevate the lower limbs in position until the feet are as high as the face; from this let them fall in a full sweep, and passing between the bars, rise to the rear until they are above the head; during the latter half of this oscillation, let the arms slowly

Fig. 21.

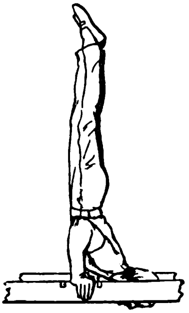
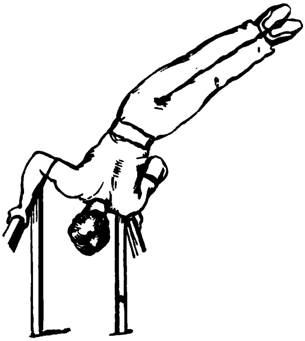


Fig. 22.



bend until the shoulders are as low as the bars, the head between them (Fig. 21); slowly let the lower limbs with the entire column of the body in position incline, and gradually descend to the left over the arm (Fig. 22), until the feet come to the ground, the bar on the left.

This exercise to be repeated over the right bar.

To pass by the rear by the single swing.

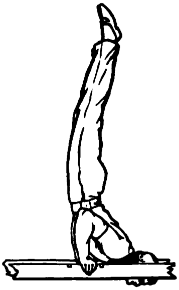
The back hollow.

EXERCISE 28.
COURSE IV.

1. Come to the Rest between the bars, inclining the head and shoulders backward during the pressure upon the hands, the back curved, the legs and feet held back.

2. Elevate the lower limbs to the front and proceed as in the previous exercise to the short-arm balance, except that, as the lower limbs fall to the rear in the return oscillation, the back is again curved inwards and the head and shoulders are inclined backwards, and this position is retained throughout the exercise (Fig. 23).

Fig. 23.



To rest on the left bar in front, and clear it in the rear by the single swing.

EXERCISE 29.
COURSE III.

1. Come to the Rest between the bars.

2. Elevate the lower limbs in position to the front, to the level of the bars, pass them over and let them rest on the left bar, relaxing the extension (Fig. 24); re-elevate the lower limbs in position

above the bar, pass them between the bars, and as in preceding exercise, incline the head and shoulders to the front, complete the rearward oscillation (Fig. 25), descending to the ground over the left bar, the bar on the left.

Fig. 24:

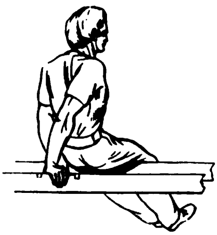
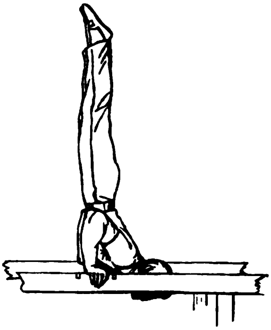


Fig. 25.



This exercise to be repeated over the right bar.

The same exercise to be repeated with the following variations:—

1. Resting on the left bar in front and clearing the right in the rear.
2. Resting on the right bar in front and clearing the left in the rear.

To rest on both bars in front, and clear the left bar in the rear by the single swing.

EXERCISE 30. 1. Come to the Rest between the bars.

COURSE III. 2. Elevate the lower limbs in position, the toes pointed to the front, until they rise above the level of the bars; at this point separate the lower limbs and let them fall till they rest on the bars

(Fig. 26); press strongly with the hands, re-elevate the lower limbs above the bars, and as they sweep to the rear, incline the head and shoulders to the front, complete the rearward oscillation, bending the arms while doing so (Fig. 27), and descending to the ground over the left bar.

Fig. 26.

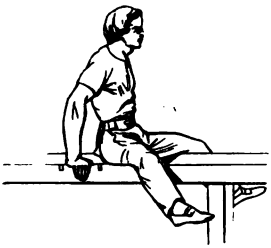
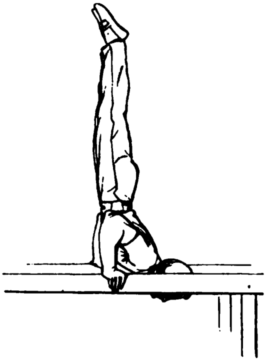


Fig. 27.



This exercise to be repeated, clearing the right bar.

To rest on the left bar in the rear by the single swing and clear the right by the rear.

EXERCISE 31.
COURSE III.

1. Come to the Rest between the bars.

2. Proceed as before until the position of the short-arm balance is reached. At this point relax the extension of the legs, pass them over and let them rest on the left bar (Fig. 28); incline the head and shoulders to the front, bend the arms until the shoulders are as low as the bars, the head between them, and at the

same time again elevate the lower limbs above the head (Fig. 29); pass them across the bars to the right, descending over the right bar.

Fig. 28.

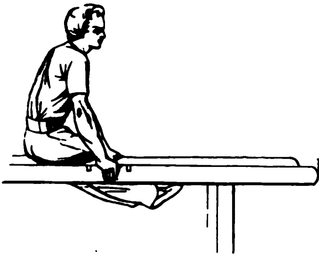
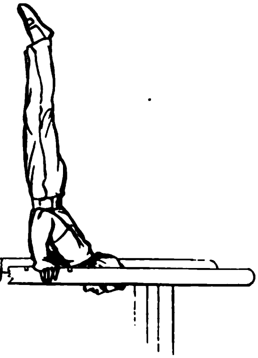


Fig. 29.



This exercise to be repeated, resting on the right bar and clearing the left.

To rest on both bars in the rear by the single swing and clear the right by the rear.

EXERCISE 32. 1. Come to the Rest between the bars.

COURSE III. 2. Proceed as before to the short arm balance; at this point slowly separate the lower limbs, relaxing the extension, and let them fall till they rest one on each bar (Fig. 17); incline the head and shoulders to the front, and bend the arms as in preceding exercise, elevate the lower limbs above the head, and pass them across the bars to the right, descending over the right bar.

This exercise to be repeated over the left bar.

To rest on the left bar in the rear by the single swing and clear it by the front.

EXERCISE 33.
COURSE III.

1. Come to the Rest between the bars.

2. Proceed as before to the short-arm balance, and thence let the lower limbs fall till they rest on the left bar in the rear (Fig. 28); re-elevate the lower limbs above the head, and thence let them slowly descend in position, and passing between the bars sweep to the front, clear the right bar, and descend yielding. During the descent of the lower limbs, bring the head and shoulders to the vertical position, gradually straighten the arms, and retain them straight while the feet clear the bar.

This exercise to be repeated, resting on the right bar in the rear and clearing it in the front.

The same exercise to be repeated with the following variations:—

1. Resting on the left bar in the rear and clearing the right in the front.

2. Resting on the right bar in the rear and clearing the left in the front.

To rest on both bars in the rear by the single swing and clear the right bar by the front.

EXERCISE 34.
COURSE III.

1. Come to the Rest between the bars.

2. Proceed as before to the short-arm balance; at this point slowly separate the legs, relaxing the extension, and let them fall till they rest, one on each bar (Fig. 17), incline the head and shoulders to the front, bend the arms, re-elevate the lower limbs above

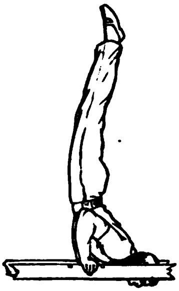
the head; from this point let the lower limbs descend as in preceding exercise, clear the right bar and descend yielding.

This exercise to be repeated, clearing the left bar.

To rest on and clear the bar or bars by the single swing, the back hollow.

EXERCISES 29–34. COURSE IV. The above exercises may also be performed with the back hollow. In this case the back remains curved inwards throughout the exercise, as previously described on page 159, Figs. 18, 19, 20, the arms and legs being retained straight and without relaxation in the oscillating movements, and the back remaining hollow during the short-arm balance (Fig. 30).

Fig. 30.



EXERCISES 29–34 COURSE IV. may be varied by introducing the different balances described in the succeeding Exercises 35–40 in the place of the short-arm balance. The System, however, requires that each of the different balances be learned and accurately performed as a separate exercise, before being employed in combinations.

To pass by the front by the double swing.

The straight-arm balance.

EXERCISE 35. COURSE IV. 1. Come to the Rest between the bars.

2. Elevate the lower limbs in position until the feet are as high as the face; from this point let them descend, and, sweeping between the bars,

ascend to the rear until they are above the head, the arms remaining straight, the column of the body and the lower limbs slightly curved throughout their length (Fig. 31);

Fig. 31.

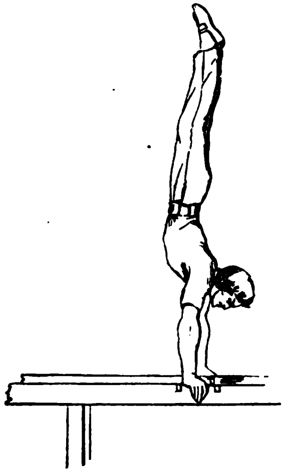
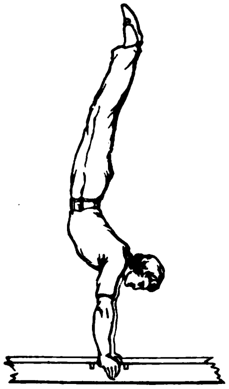


Fig. 32.



from this point let the feet again descend, and passing between the bars on the return oscillation, clear the right bar in front, and descend yielding.

This exercise to be repeated over the left bar.

The above exercise may also be performed with the back hollow throughout, when care must be taken to curve the back inwards during the return backward oscillation, and to retain this position throughout the exercise (Fig. 32).

To rise to the balance, and back lift over.

EXERCISE 36. 1. Come to the Rest between the bars.
COURSE IV. 2. Slowly incline the head and shoulders to the front without swing, elevating the lower limbs to the rear, and, as they rise to the level of

the bars, bend the arms, and pressing firmly on the hands let the lower limbs pass above the head to the position of the short-arm balance (Fig. 30). Slowly let the lower limbs and entire column of the body in position sweep over the head till the feet reach the ground.

When the position of the short-arm balance is reached, the exercise may be continued by pressing firmly again on the hands and raising the body to the position of the straight-arm balance (Figs. 31 and 32). In descending press with the hands away from the bar, re-bend the arms, and let the lower limbs sweep over the head till the feet reach the ground.

This exercise is performed close to the end of the bars.

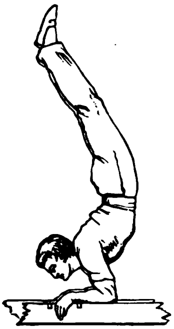
The forearm balance.

EXERCISE 37.
COURSE IV.

1. Place the hands and forearm on the bars, the thumbs inside, the fingers outside, and by pressure upon the hands and forearm, come to the position of the forearm Rest upon the bars.

2. Retaining the hands and forearm upon the bars, elevate the lower limbs to the front and thence let them sweep to the rear and come to the position of the balance, the body being supported by the whole forearm, instead of by the hands only as in the previous exercises (Fig. 33).

Fig. 33.



Descend by one of the previous methods, passing by the front or by the rear.

The forearm balance.

A Second Method.

EXERCISE 38. 1. Come to the Rest between the bars.

COURSE IV. 2. Proceed to the short-arm balance ordinary or hollow-back. Now allow the forearms gradually to sink upon the bars and to support the body, as in the previous exercise (Fig. 33).

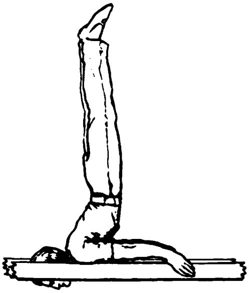
Descend as before.

The upper-arm balance.

EXERCISE 39. 1. Come to the Rest between the bars.

COURSE IV. 2. Proceed as before to the position of the short-arm balance. At this point, press strongly from the hands, and advance the head and trunk to the front till the whole arm rests upon the bar (Fig. 34), and the body is supported on the bars by the whole length of the arms and shoulders.

Fig. 34.



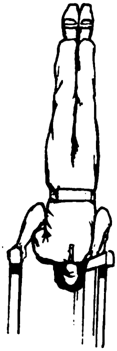
In descending rest on the shoulders and bring the hands again closer to the trunk, press downwards and come once more to the short-arm balance, thence descending to the ground as usual.

The shoulder balance.

EXERCISE 40. 1. Come to the Rest between the bars.

COURSE IV. 2. Proceed to the short-arm balance, and at this point incline the body over towards the right so as to bring the weight of it over the right arm, and let the right shoulder rest upon the bar (Fig. 35).

Fig. 35.



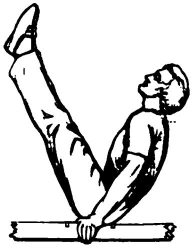
Pull with the left hand, and raising the right shoulder return to the position of the short-arm balance. The exercise may then be repeated on the left shoulder, or the descent may be made as previously described.

The forward balance.

EXERCISE 41. COURSE IV. 1. Come to the Rest between the bars.

2. Gradually elevate the lower limbs to the front, keeping legs and feet stiff and together, the toes pointed to the front, maintaining the arms straight throughout. When the lower limbs rise above the level of the bars, allow the head and shoulders to fall slightly backwards till the position shown in the Figure is reached (Fig. 36). Retain the position.

Fig. 36.



In descending, let the head and shoulders come forward to the upright position as the lower limbs slowly descend, and come to the original position of the Rest, and thence to the ground.

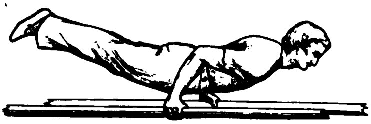
To form the straight line above bars.

EXERCISE 42. COURSE IV. 1. Come to the Rest between the bars, and thence by the ordinary method to the seat astride both bars, the hands in front (Fig. 17).

2. Slowly depress the head and shoulders to the front, and

at the same time pressing strongly upon the hands and wrists, let the lower limbs rise to the rear, the body being maintained stiff and the legs straight and together, the arms being bent as little as possible, that is only bent forward with the inclination of the head. Retain the balance and slowly descend.

Fig. 37.



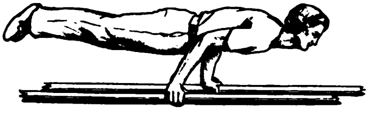
The above exercise may be performed from the Rest, by inclining the head and shoulders forward and elevating the lower limbs in position to the rear; but it is more arduous.

To form the straight line above bars.

Resting on the elbows.

EXERCISE 43. COURSE IV. 1. Come to the Rest between the bars; thence elevate the lower limbs to the rear, and as they rise above the level of the bars fully separate them and let them sink till they rest on the bars (Fig. 17).

Fig. 38.



2. Incline the head and shoulders forward, and in doing so bend the elbows inward till the trunk is supported upon them, and continuing the forward inclination of the head and

shoulders, raise the lower limbs and bring them together till the body is in a horizontal line above the bars. Retain the balance.

In descending, part the lower limbs and let them again rest upon the bars, and from thence re-elevate them and descend to the ground by the ordinary method previously described.

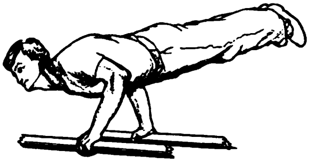
To form the straight line above bars.

Resting on the single elbow.

EXERCISE 44.
COURSE IV.

1. Come to the Rest between the bars; elevate the lower limbs to the rear, and as they rise above the level of the bars pass them over and let them rest upon the left bar (Fig. 28).

Fig. 39.



2. Incline the head and shoulders forward, letting them fall well over the right bar, at the same time bending the left elbow inwards, and supporting the trunk upon it re-elevate the lower limbs till the body is in a horizontal line above the bars supported upon the left elbow at right angles to the bars. Release the grasp of the right hand, clench the fist, and let the arm remain extended to the front.

In descending re-grasp the right bar, allow the lower limbs to sink again upon the left bar, elevating the head and shoulders and facing the front; from thence descend to the ground by the ordinary method previously described.

This exercise to be repeated over the right elbow (Fig. 39).

To circle in the straight line above bars.

Resting on the elbows.

EXERCISE 45.
COURSE IV.

1. Come to the Rest and thence to the position of the straight line above bars resting on the elbows, as above described (Fig. 38).

2. Leaning to the left allow the body to be supported so far as possible on the left elbow, and quickly shifting the right hand along the bar further to the rear, come to the position of the straight line upon the left elbow at right angles to the bars (cf. Fig. 39). Now bring the right arm across to the left bar, and bringing the right elbow beneath the chest, support the body on both elbows on the single bar. Without pause lean over the right elbow, free the left and grasp the further bar (originally the right bar) with the left hand, and passing the body in position over the nearer bar, support the body on both elbows again between the bars.

Repeat the above, supporting the body on the left elbow on the opposite bar, and in this manner complete the circle. This exercise to be repeated, the right elbow leading.

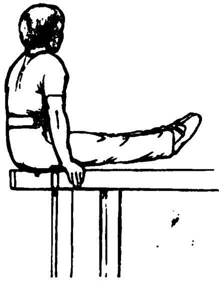
To circle above the bars, the legs up.

EXERCISE 46.
COURSE IV.

1. Come to the Rest between the bars.

2. Elevate the lower limbs till they are in a horizontal line above the bars, retaining the arms straight, the trunk of the body erect (Fig. 40). Gradually pass the legs in position over the left bar, letting the weight of the body fall as far as possible on the left arm, and, quickly loosing the grasp of the right bar with the right hand, grasp the left bar. Now lean over the right arm, so that the weight of the body falls as far as

Fig. 40.



possible upon it, and quickly pass the free left arm ove the further bar (originally the right bar), passing the l limbs, in doing so, in position over the nearer bar till are between the bars.

Repeat the above, loosing the grasp of the right hand, complete the circle.

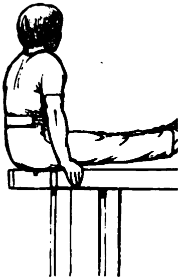
Third Series.

Position of attention at the entrance to the bars, the front back to the bars.

The single march and swing forwards.

EXERCISE 47. 1. Come to the Rest between the bar
COURSE II. 2. Elevate the lower limbs in posi
to the front, the legs and feet together, the toes pointed to the front, until they rise above the level of the bars (Fig. 41); release the grasp of the right hand and advance it 6 inches along the bar. Let the lower limbs sweep backward in the return oscillation to the rear, the head and shoulders being inclined forward and the lower limbs elevated to the rear in position. Now let the lower limbs sweep once more to the front, and on t reaching the level of the bars advance the left hand 6 in beyond the right. Repeat.

Fig. 41.



COURSE III. This exercise to be repeated, advan forwards with each rear oscillation.

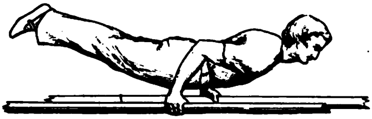
The single march and swing backwards.

EXERCISE 48. 1. Come to the Backward Rest betw
COURSE II. the bars.

2. Elevate the lower limbs to the fron in the previous exercise, and on the return oscillation to

rear, incline the trunk and shoulders to the front and, bending the arms, elevate the lower limbs to the rear till they rise above the level of the bars ; release the grasp of the right hand and advance it 6 inches backwards along the bar

Fig. 42.



(Fig. 42). Allow the lower limbs to sweep once more to the front, and on their return oscillation to the rear advance the left hand backwards 6 inches beyond the right. Repeat.

COURSE III. This exercise to be repeated, advancing backwards with each front oscillation.

The double march and swing forwards.

EXERCISE 49. 1. Come to the Rest upon the bars.

COURSE II. 2. Elevate the lower limbs in position to the front till they rise above the level of the bars ; quickly release the grasp of both hands and advance them 6 inches along the bars ; let the lower limbs sweep back in position to the rear, and on the return oscillation to the front again advance both hands 6 inches forwards. Repeat.

COURSE III. This exercise to be repeated, advancing forwards with each rear oscillation.

The double march and swing backwards.

EXERCISE 50. 1. Come to the Backward Rest between
COURSE II. the bars.

2. Proceed as in the single march, and swing backwards till the lower limbs rise above the level of

the bars on the return oscillation to the rear. At this point quickly release the grasp of both hands and advance them 6 inches backwards along the bars. Allow the lower limbs again to sweep to the front, and on the return oscillation to the rear advance the hands 6 inches to the rear along the bars. Repeat.

COURSE III. This exercise to be repeated, advancing backwards with each front oscillation.

COURSE IV. The four preceding exercises may also be practised with the arms bent throughout, from the position of the bent arm Rest upon the bars. In this case they are considerably more arduous.

COURSE IV. Another and yet more arduous variation of the preceding exercises is to accompany the march forwards or backwards by bending and straightening the arms during the oscillations to the front and the rear. In this case the arms are fully extended during the elevation of the lower limbs to the front, and quickly bent at the end of the oscillation to the rear.

COURSE IV. The marches may be still further varied by retaining the position in balance at the end of the front oscillation.

The single march and rest forwards.

EXERCISE 51. 1. Come to Rest between the bars.

COURSE III. 2. Elevate the lower limbs in position and bring them to the rest on the left bar, as in preceding exercises; incline the head and shoulders to the front, re-grasp the bars in advance of the thighs

(Fig. 43), re-elevate the lower limbs until the feet are above the head (Fig. 44); from this point let them slowly descend in position, and passing between the bars, sweep to the front, and again rest on the left bar. During the descent of the lower limbs, gradually straighten the arms, and retain them straight until the legs rest on the bar. Repeat.

Fig. 43.

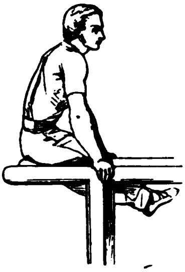
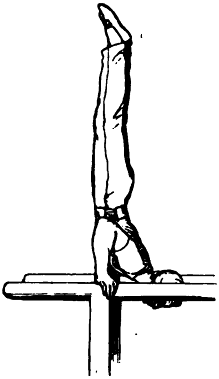


Fig. 44.



At the end of the bars, on the last elevation of the feet above the head, incline the trunk and lower limbs over the left bar, and descend yielding.

This exercise to be repeated on the right bar.

The same exercise to be repeated, resting on the right and left bar alternately.

The single march and rest backwards.

EXERCISE 52.
COURSE III.

1. Come to the Backward Rest between the bars.

2. Proceed to the position of the short-arm balance, at this point relax the extension of the legs,

pass them over and let them rest on the right bar; pass both hands behind the thighs and re-grasp the bars (Fig. 45),

Fig. 45.

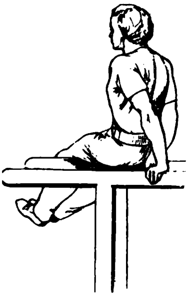
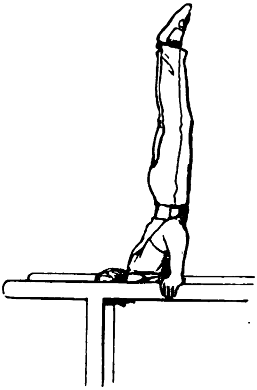


Fig. 46.



re-elevate the lower limbs, pass them between the bars, and again let them rise above the head (Fig. 46), and again fall till they rest on the right bar. Repeat.

At the end of the bars, on the last elevation of the feet above the head, pass over the right bar, as in preceding exercise.

This exercise to be repeated on the left bar.

The same exercise to be repeated, resting on the right and left bar alternately.

The double march and rest forwards.

EXERCISE 53. COURSE III. 1. Come to the Rest between the bars.

2. Elevate the lower limbs in position, the toes pointed to the front, until they rise above the level of the bars; at this point separate the lower

limbs and let them fall till they rest on the bars ; incline the head and shoulders to the front, re-grasp the bars in advance of the thighs (Fig. 47), re-elevate the lower limbs until the feet are above the head (Fig. 48), let the lower limbs descend, sweep to the front and again rest in front on both bars. Repeat.

Fig. 47.

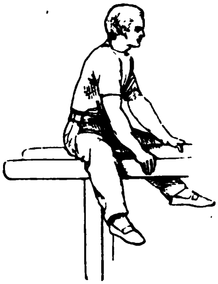
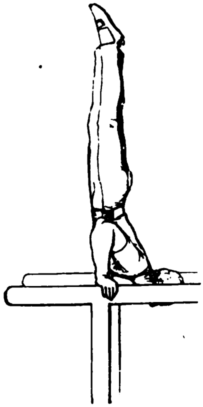


Fig. 48.



At the end of the bars on the last elevation of the feet above the head, continue the movement of the lower limbs, carrying the feet completely over the head to the front, press strongly with the hands and descend yielding, the back to the end of the bars.

The double march and rest backwards.

EXERCISE 54.
COURSE III.

1. Come to the Backward Rest between the bars.

2. Proceed to the short-arm balance ; thence slowly separate the legs, relaxing the extension, and

let them fall till they rest, one on each bar; pass both hands behind the thighs, and re-grasp the bars (Fig. 49); re-elevate the lower limbs to the front, pass them between the bars, and let them rise until they are above the head (Fig. 50); slowly separate the legs, relaxing the extension and again let them rest on the bars. Repeat.

Fig. 49.

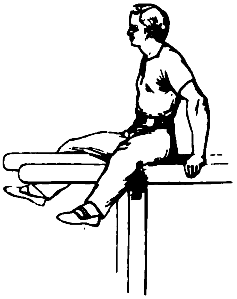
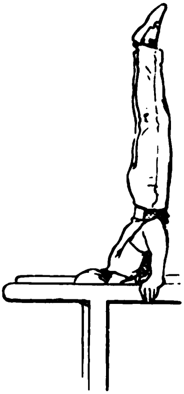


Fig. 50.



At the end of the bars, from the last rest, bring the lower limbs again between the bars, and shoot them out to the rear in the line of the bars, pushing strongly with the hands.

The single and double marches and rest.

The back hollow.

EXERCISES 51–54. COURSE IV. The above four exercises should be performed also in the hollow-back position, retaining the legs and arms straight when resting on the bar, and preserving the hollow-back form of the short-arm balance. Cf. Figs. 18, 19, 20, and 30.

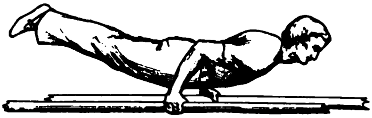
The single march and rest forwards.

Showing the straight line.

EXERCISE 55. COURSE IV. 1. Come to the Rest between the bars.

2. Elevate the lower limbs in position and let them rest upon the left bar; re-grasp the bars in front of the thighs (Fig. 47), but instead of re-elevating the lower limbs by the rear to the position of the short-arm balance, incline the head and shoulders forward and let the lower limbs come between the bars (Fig. 51) in the position of the straight line. Maintain the position; let the lower limbs fall slowly to the front, and again rest on the left bar. Repeat.

Fig. 51.



At the end of the bars, after forming the last straight line, let the lower limbs fall to the front, and, again sweeping to the rear, rise above the head and over it, till the feet reach the ground.

This exercise to be repeated on the right bar; and also resting on the right and left bar alternately.

The double march and rest forwards.

Showing the straight line.

EXERCISE 56. COURSE IV. 1. Come to the Rest between the bars.

2. Proceed as in the ordinary Double March and Rest till the legs rest on the bars; incline the head and shoulders to the front and proceed to

form the straight line as in the previous exercise. Maintain the position; let the lower limbs fall slowly to the front, and let them come to the rest upon the bars. Repeat.

Descend as in the previous exercise.

The single and double marches and rest.

Showing the balance and straight line.

VARIATIONS.
COURSE IV.

The two previous exercises, as also the single and double march and rest backwards, may be varied by showing the straight line previously to or following the balance. In the former case, which is more arduous, press strongly on the hands and so up into short-arm balance from the position of the straight line given in the two foregoing exercises. In the latter, proceed by the ordinary method to the short arm balance, and letting the lower limbs fall slowly, pause as they reach the level of the bars. In both cases continue the exercises as previously described.

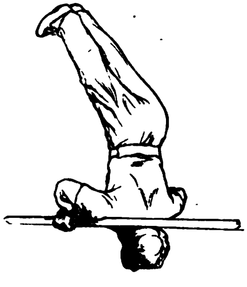
To turn over between the bars forwards.

The forward roll.

EXERCISE 57.
COURSE IV.

1. Come to the Rest between the bars.
2. Elevate the lower limbs in position to the front, and on the return oscillation let them sweep over the head till the position of the short-arm balance is reached. This position is only momentary; bending the elbows outwards over the bars, rest on the shoulders and slowly round the back (Fig. 52), and retaining the grasp let the limbs pass over the head, and as the trunk comes to the horizontal position between the bars

Fig. 52.



quickly release the grasp, and re-grasp the bar in front, letting the lower limbs fall in position downwards, and returning to the original position of the rest between the bars.

In repeating, continue the backward sweep of the limbs to the balance, without pausing at the rest.

Forward rolls from the straight-arm balance, fore-arm balance, and upper-arm balance.

VARIATIONS.
COURSE IV.

The above exercise may be varied by swinging up to the straight arm balance, the forearm balance, or the upper-arm balance.

In the case of the straight arm balance (Fig. 32) the arms are gradually bent till the position of the short-arm balance is reached, and the exercise then continued as above described.

In the case of the forearm balance (Fig. 33) place the shoulders on the bars immediately after showing the balance, supporting the body on them till the time comes to quit the grasp, as in the ordinary exercise.

In the case of the upper-arm balance (Fig. 34) the body is supported throughout by the whole arm, beneath the shoulder, till the time comes to quit the grasp.

To turn over between the bars backwards.

The backward roll.

EXERCISE 58.
COURSE IV.

1. Come to the Rest between the bars.
2. Elevate both legs in position to the front, the feet together, the toes pointed forward, till they are in a horizontal position level with the bars (Fig. 53).

As they rise above this let the trunk fall quickly backwards, the arms resting on the bars beneath the shoulder. So soon as the feet have passed above the head quit the grasp (Fig. 54),

Fig. 53.

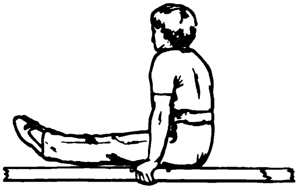
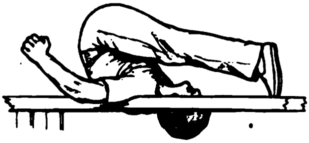


Fig. 54.



and as they descend between the bars, quickly re-grasp the bars and come to the original position of the rest. Repeat.

To turn over forwards from the seat astride the bars.

EXERCISE 59.
COURSE IV.

1. Come to the Rest and thence to the sitting position astride the bars (Fig. 47).

2. Release the grasp and bring the arms to the front, point the hands and arms downward between the legs, bending the head and shoulders forward between the bars, and bring the arms behind the body between the

Fig. 55.

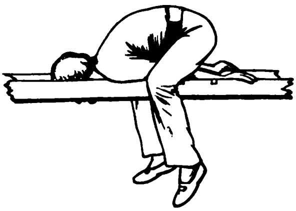
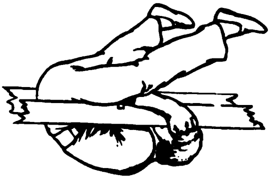


Fig. 56.



legs, keeping the back of the hands towards the bar. Pass the hands over the bars and grasp them, the palms of the hands inwards, the thumbs on the top (Fig. 55), and, passing the head beneath the body, complete the turn (Fig. 56). Bring the arms to the front and resume the original position.

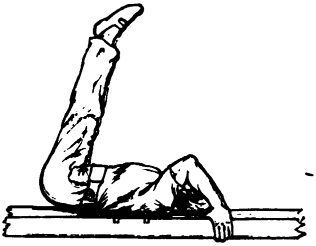
To turn over forwards on the single bar.

The roll on one bar.

EXERCISE 60. COURSE IV. 1. Come to the Rest at the end of the bars.

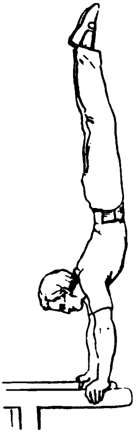
2. Elevate the lower limbs to the front, and on the return oscillation let them rise till the position of the short-arm balance is reached, and thence the shoulder balance (Fig. 35) on the right bar. Bending the back outwards let the body slowly descend till it rests upon the bar (Fig. 57). Now let the lower limbs descend, and, releasing the grasp and elevating the trunk, come to the sitting position outside the bar, re-grasping the bars in front (cf. Fig. 20). Re-elevate the lower limbs, and come to the shoulder balance on the left bar, and repeat the exercise on this bar.

Fig. 57.



To march above the bars.

Fig. 58.



EXERCISE 61. COURSE IV. 1. Come to the Rest between the bars.

2. Proceed as before to the position of the straight-arm balance (Fig. 58); retain the arms straight, advance the right hand 6 inches beyond the left, advance the left hand 6 inches beyond the right.

At the end of the bars, carry the feet completely over the head to the ground, and descend yielding.

To march above the bars backwards.

EXERCISE 62. COURSE IV. 1. Come to the Backward Rest between the bars.

2. Proceed as before to the straight-arm balance; retain the arms straight; advance the right hand to the rear 6 inches beyond the left, advance the left hand 6 inches beyond the right. Repeat.

Descend as in the previous exercise.

COURSE IV. Both the above marches above bars to be repeated with the arms bent (short-arm balance) (Fig. 30).

The double march above bars.

EXERCISE 63. COURSE IV. 1. Come to the Rest between the bars.

2. Proceed as before to the straight-arm balance; retain the arms straight; press firmly on the bars with the hands and wrists and, springing

forward, grasp both bars about 6 inches in front, being careful to retain the arms at full extension. Repeat.

At the end of the bars carry the feet completely over the head to the ground, and descend yielding.

The double march above bars backwards.

EXERCISE 64. COURSE IV. 1. Come to the Backward Rest on the bars.

2. Proceed as before to the straight-arm balance; pressing firmly on the hands and wrists, spring backward and grasp both bars 6 inches to the rear, retaining the arms straight and at full extension.

Descend as in the previous exercise.

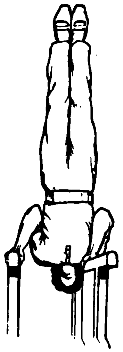
COURSE IV. Both the above double marches above bars to be repeated with the arms bent (short-arm balance) (Fig. 30).

The alternate march above bars, resting on the shoulders.

EXERCISE 65. COURSE IV. 1. Come to the Rest between the bars, and thence to the position of the short-arm balance as previously described.

2. Let the weight of the body rest over the left arm, and sink into the shoulder balance on the left shoulder. Release the grasp of the right hand and advance it 6 inches along the bar. Bring the weight of the body over the right arm and sink to the shoulder balance on the right shoulder (Fig. 59). Advance the left hand 6 inches, and repeat.

Fig. 59.



The alternate march above bars backwards, resting on the shoulders.

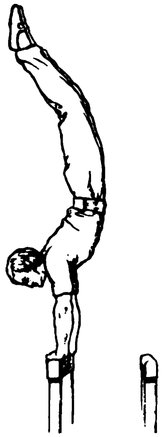
EXERCISE 66. COURSE IV. 1 and 2. Come to the Backward Rest between the bars, and thence to the shoulder balance on the left bar. Advance the right hand 6 inches to the rear, raise the body and come to the shoulder balance on the right bar. Advance the left hand 6 inches to the rear and repeat.

The circular march above bars.

EXERCISE 67. COURSE IV. 1. Come to the Rest between the bars, at the entrance to the bars.

2. Proceed to the straight-arm balance as before. Press firmly with the right hand against and away from the right bar, and at the same time inclining the lower limbs slightly towards the left side, let the weight of the balance fall as much as possible on the left arm. Release the grasp of the right hand, and turning the body round to the left, grasp the left bar with the right hand (Fig. 60); incline the body over the right arm and, releasing the grasp of the left, place it on the opposite bar about 6 inches beyond the right. Repeat the movement.

Fig. 60.



The single march above bars.

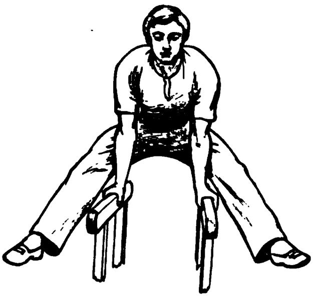
The legs astride.

EXERCISE 68. COURSE IV. 1. Come to the Rest between the bars, at the entrance to the bars.

2. Proceed to the straight-arm balance as before. Slowly let the lower limbs descend, one each side

of the arm, to the position of Fig. 61. Retaining the arms straight and at full extension advance the left hand 6 inches beyond the right; advance the right 6 inches beyond the left. Repeat.

Fig. 61.



At the end of the bars let the lower limbs pass to the rear and again come forward between the bars; again let them swing to the rear and, passing completely over the head, come to the ground yielding.

The single march above bars backwards.

The legs astride.

EXERCISE 69.
COURSE IV.

1. Come to the Backward Rest at the end of and between the bars.

2. Elevate the lower limbs to the front and let them sweep to the rear to the position of the straight-arm balance. Thence let them slowly descend, one each side of the arm, to the position of Fig. 61. Retaining the arms straight and at full extension, advance the left hand 6 inches to the rear; advance the right 6 inches beyond the left. Repeat.

In descending at the end of the bars, elevate the lower limbs to the rear above the level of the bars till the legs touch, straight and together, and descend yielding.

The double march above bars.

The legs astride.

EXERCISE 70.
COURSE IV.

1. Come to the Rest between the bars at the entrance to the bars.

2. Come as in the previous exercise to the position of Fig. 61. Pressing strongly downwards with the hands and wrists, release the grasp of both hands and

spring forwards, re-grasping the bars firmly 6 inches in advance, taking care to retain the arms straight throughout.

Descend as in the single march forwards.

The double march above bars backwards.

The legs astride.

EXERCISE 71. COURSE IV. 1. Come to the Backward Rest at the end of and between the bars.

2. Proceed as in the previous exercise to the position of Fig. 61. Pressing firmly on the hands and wrists, release the grasp of both hands and spring backwards, re-grasping the bars 6 inches to the rear, being careful to retain the arms straight. Repeat.

Descend as in the single march backwards.

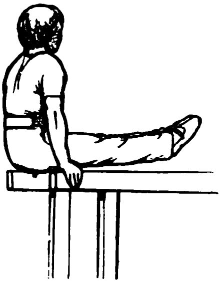
APPENDIX TO THE PARALLEL BARS.

The 'cut in' to the rest between the bars.

From the end of the bar.

EXERCISE 72. 1. Grasp the bars with both hands, bend the legs, and on the return extension spring from the ground, and dividing the legs, pass one over each bar from the outside, keeping the arms and legs straight and the toes pointed from the time of the spring. As the legs pass over the bars quickly release the grasp of the hands, pass the legs beneath them, re-grasp with the hands (Fig. 62), and come to the position of the Rest between the bars.

Fig. 62.



VARIATION. A variety of the 'cut in' is to pass both legs over one bar without separating the legs, and quitting the grasp of the left or right hand, according to the exercise.

The cutaway from the bars, forwards.

From the Rest between the bars at the end of the bars.

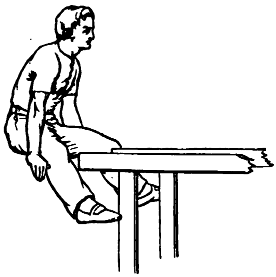
EXERCISE 73. 1. Elevate the lower limbs to the front, and in the return oscillation to the rear let them rise above the level of the bars; rapidly separate them, bring each leg outside the corresponding bar, and pressing strongly with the hands away from the bar let the body pass in position to the front, clearing the bars. Rapidly bring the legs and feet together and descend.

The cutaway from the bars, backwards.

From the Back Rest between the bars at the end of the bars.

EXERCISE 74. 1. Rapidly elevate both legs in position to the front, when they rise above the bars separate them, and at the same moment pressing strongly with the hands and wrists away from the bars let the body pass in position to the rear (Fig. 63), clearing the bars. Rapidly bring the legs and feet together, and descend yielding.

Fig. 63.



To circle over both bars.

From the end of the bars.

EXERCISE 75. 1. Grasp the bars with both hands, bend the legs, and on the return extension spring from the ground, elevating the lower limbs in position to the left outside the left bar ; quit the grasp of the left hand and pass the legs beneath it, re-grasp the bar and without pause quit the grasp of the right hand, and passing the legs over the right bar, descend yielding on to the ground at the end of and facing the bars.

To vault in to the rest between the bars.

From the side of the bars.

EXERCISE 76. 1. Place the hands on the near bar, reversing the grasp of the right hand. Bend the lower limbs for the spring, and on their return extension vault over the near bar by the left as in an ordinary front vault over the vaulting bar, keeping the legs straight and together. As the body rises above the bar quickly release the grasp of the left hand and place it opposite the right upon the further bar, allowing the lower limbs to descend to the position of the Rest.

This exercise to be repeated on the right.

The spring away from the balance.

From the single bar.

EXERCISE 77. 1. Press strongly away from the bars with the hands and wrists so as to bring the head and upper part of the trunk well clear of the bars.

Quickly bend the body and let the lower limbs descend forwards, and at the same moment quitting the grasp and elevating the head and shoulders, come to the ground yieldingly at the end of, but outside, the bars.

From the end of the bars this exercise is employed as an alternative finish to the various rolls and to the marches above bars, whether from short- or straight-arm balance, instead of allowing the lower limbs to sweep over the head. When thus performed from the end of the bars it is merely necessary to press away from the bars with the hands.

To turn over between the bars forwards.

The back hollow.

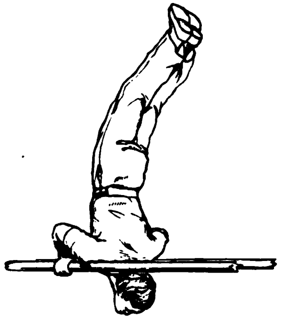
(Hollow-back forward roll.)

EXERCISE 78. 1. Come to the Rest between the bars.

2. Elevate the lower limbs to the front, and on the return oscillation let them sweep over the head till the position of the short-arm balance is reached, keeping the back hollow throughout. This position is only momentary: bending the arms outwards over the bars (Fig. 64), let the lower limbs pass over the head, and as the trunk comes between the bars again, quickly release the grasp and re-grasp the bar in front, letting the lower limbs fall in position downward and returning to the position of the Rest.

In repeating, do not pause at the Rest, but continue the sweep of the body into the short-arm balance.

Fig. 64.



To turn over between the bars backwards.

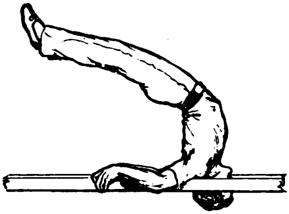
The back hollow.

(*Hollow-back backward roll.*)

EXERCISE 79. 1. Come to the Rest between the bars.

2. Elevate the lower limbs in position to the front, and on the return oscillation immediately curve the back inwards and let the legs sweep back above the bars till the position of the short-arm balance is reached. This position is only momentary: again let the limbs sweep forward to the front, and, as they do so, rapidly bend the arms and support the body on the arms beneath the shoulders, retaining a firm grasp of the bar. Continue the sweep of the limbs onward and upward, and as they rise to the perpendicular position release the grasp of the hands, quickly re-grasping as they pass over the head, thus returning to the position of the balance and thence to the rest between the bars.

Fig. 65.



This exercise is usually set from either the short- or the straight-arm balance; in this case the balance is of course firmly shown to start with, and each successive roll finishes with the original balance.

VARIATIONS. Variations of the hollow-back rolls may be made by releasing the grasp of the hands as the body rises towards the perpendicular, and either extending the arms outwards as the limbs sweep over the head and re-grasping as they descend ; or by giving extra impetus to the body as it rises and quitting the grasp of the hands, it is possible to rise clear above the bars as the lower limbs sweep over the head, and quickly re-grasp them when they begin to descend. Neither of these exercises has any advantage physically over those already described, and may only be attempted by the most qualified gymnast.

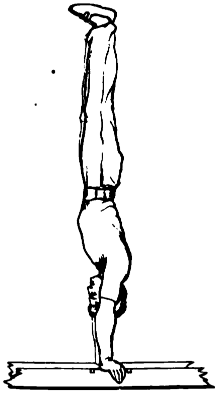
The perpendicular balance.

EXERCISE 80. 1. Proceed as usual to the straight-arm balance.

2. Retaining the arms at full extension gradually lower the head between the arms, at the same time bringing the lower limbs forward till the whole body is in one perpendicular line.

To descend re-elevate the head and shoulders backwards through the arms, at the same time curving the lower limbs till the ordinary straight-arm balance is reached, and descend as usual.

Fig. 66.



To circle in the balance above bars.

From the side of the bars.

EXERCISE 81. 1. Grasp the nearer bar with the hands reversed and come to the Rest, and letting the lower limbs rise to the rear come to the balance, the chest resting on the further bar, the head outside it.

Release the grasp of the right hand, and bring it over to the further bar, incline the body over the right arm, and move the left hand along the bar to the place previously occupied by the right. Elevate the head and shoulders, pass them over the bar, and come to the short-arm balance between the bars. Now elevate the head and shoulders and pass them over the (originally) nearer bar and bring the left hand across to the further bar, thus coming to the balance with the chest resting on the nearer bar, the hands on the further bar. Repeat the above, bringing the right hand over to the nearer bar, elevating the head and shoulders and shifting the left hand, thus showing the short-arm balance again between the bars. Now elevate the head and shoulders over the further bar, bring the left hand by the rear to the nearer bar and come to the first position.

Let the lower limbs slowly descend to the ground, elevating the head and shoulders.

THE MOVEABLE PARALLEL BARS.

THE exercises on this machine are of a somewhat inferior order to those on the ordinary parallel bars, although useful and interesting They address themselves much more directly to the upper limbs, giving power and security to the grasp, and certainty and facility of action to the hand and arm. They divide themselves into three series, the first consisting of vaulting exercises executed *above* the bars, the bar at the height of the shoulder; the second, of those *under* the bars, when elevated to the reach of the hands, with or without oscillation; and the third, of those rising *between* the bars. The first is chiefly directed to the lower limbs; the second to the upper limbs alone; and the third to both. The first series may be performed also on the ordinary parallel bars, but they properly belong to this machine. which principally differs from the foregoing in that the bars admit of being elevated or depressed to any required height; they are further sufficiently wide apart to admit of the body rising easily between them.

The position of the instructor should be on the right or left front of the learner.

This machine consists of two bars and two sets of standards, in all respects the same as the Vaulting Bar and standards already described. The bars should be rather wider apart than those of the ordinary parallel bars, say from 20 to 22 inches from centre to centre, and it is usual in gymnasia, where the vaulting bar and horizontal bar are separate machines, to combine the former with the moveable parallel bars, one bar being temporarily removed when required.

The methods of vaulting the two bars described in the Appendix are merely serviceable by reason of the agility they demand; otherwise they possess no merit over similar exercises on the single bar. They must never be performed without the presence of an instructor, and should be approached by substituting a cord for the second bar. They bear the same relation to the physical education of the System as all exercises designed solely to give variety.

First Series . . .	*Over the bars.*
Second Series . . .	*Under the bars.*
Third Series . . .	*Rising between the bars.*

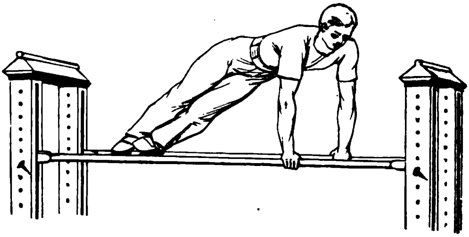
First Series.

Position of attention, facing the bars.

To clear the bars, resting on the first.

EXERCISE I. COURSE I. 1. Raise both hands and grasp the first bar, the hands at the distance, the fingers and thumb meeting, the feet immediately under the hands. Spring from the ground to the right and rest with both feet on the first bar, and at the same

Fig. 1.



limbs fall again between the bars, return to the rear (Fig. 6), clear the second bar, and descend yielding, facing the bars.

This exercise to be repeated on the left.

COURSE III. Exercises 3, 4, and 5 may be performed with the back hollow, the body being slightly curved and the arms fully extended as in similar exercises described under the Parallel Bars.

Second Series.

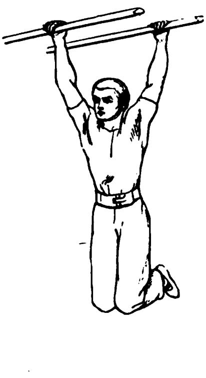
Position of attention, facing the bars.

To pass from the first to the second bar, the right hand leading.

EXERCISE 6. COURSE I. 1. Raise both hands and grasp the first bar, the hands at the distance, the fingers and thumbs together, sink to the full extension of the arms, bend the lower limbs, the knees in a line with the body, the feet behind, the head held back, the eyes directed to the reach of the hands.

2. Sustain the body in position, advance the right hand and grasp the second bar (Fig. 7), the left following; retake the grasp of the first bar with the left hand, the right following, replace the feet on the ground and come to the first position.

Fig. 7.



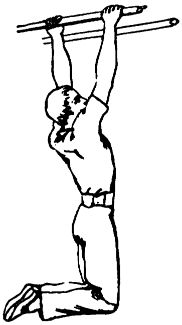
This exercise to be repeated with the left hand leading.

To pass from the first to the second bar, changing front.

EXERCISE 7.
COURSE II.

1. Grasp the bar and bend the lower limbs as in the previous exercise.

Fig. 8.



2. Proceed as in the previous exercise until both hands are on the second bar, quit the grasp with the right, swing on the left, pass under the bar, advance the right hand the distance beyond the left and grasp the bar (Fig. 8), changing front; reverse the grasp of the left hand, retaking the same part of the bar; advance the right hand again to the first bar, the left following, rechange the front, replace the feet on the ground and come to the first position.

To pass from the first to the second bar, both hands at once.

EXERCISE 8.
COURSE II.

1. Grasp the bar as before, lift the feet from the ground, pressing slightly from the rear, and causing a forward oscillation.

2. Augment the rearward return by the action of the loins, and on the forward return, as the feet come under the bar, bend the arms and quit the grasp with both hands, and spring to the second bar; govern the forward oscillation and on the rearward return spring backwards to the first bar, replace the feet on the ground and come to the first position.

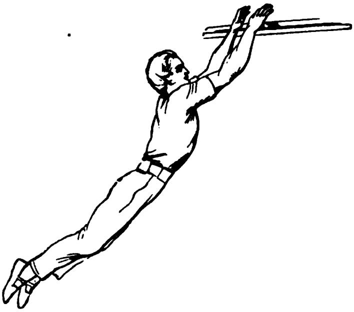
To pass from the first to the second bar, both hands at once, changing front.

EXERCISE 9.
COURSE III.

1. and 2. As in the previous exercise to the spring to the second bar.

3. Augment both the forward and the rearward oscillation, and on the return forward quit the grasp with both hands, rapidly change front (Fig. 9), and retake the bar, renew the oscillation, spring again to the first bar, again change front, replace the feet on the ground, and rise to the first position.

Fig. 9



Third Series.

Position of attention, at the centre beneath the bars.

To rise between the bars, the legs resting on the single bar.

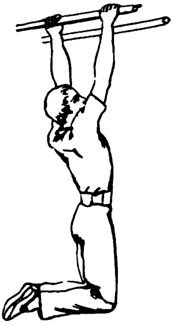
EXERCISE 10.
COURSE I.

1. Raise both hands and grasp the bars right and left, the fingers and thumbs meeting. Lift both feet from the ground, and pass them over the left bar, resting on it under the knees, the head and shoulders held back, the trunk of the body sustained.

To pass from the first to the second bar, changing front.

EXERCISE 7. COURSE II. 1. Grasp the bar and bend the lower limbs as in the previous exercise.

Fig. 8.



2. Proceed as in the previous exercise until both hands are on the second bar, quit the grasp with the right, swing on the left, pass under the bar, advance the right hand the distance beyond the left and grasp the bar (Fig. 8), changing front; reverse the grasp of the left hand, retaking the same part of the bar; advance the right hand again to the first bar, the left following, rechange the front, replace the feet on the ground and come to the first position.

To pass from the first to the second bar, both hands at once.

EXERCISE 8. COURSE II. 1. Grasp the bar as before, lift the feet from the ground, pressing slightly from the rear, and causing a forward oscillation.

2. Augment the rearward return by the action of the loins, and on the forward return, as the feet come under the bar, bend the arms and quit the grasp with both hands, and spring to the second bar; govern the forward oscillation and on the rearward return spring backwards to the first bar, replace the feet on the ground and come to the first position.

vertical line between the bars, the legs straight and together, the column of the body upright; quit the grasp of the hands, bring the arms close in by the sides, and descend yielding.

To rise between the bars by the forearms.

EXERCISE 12.
COURSE II.

1. Spring from the ground until the shoulders are above the bars, at the same time bringing the closed hands up to the breasts; spread out the folded arms horizontally, and by them rest on the bars, the chest advanced, the head held back, the lower limbs straight and together, the toes pointed to the ground (Fig. 13).

Fig 13.

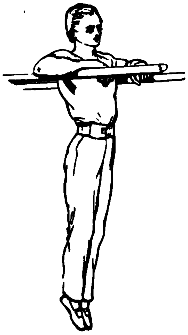
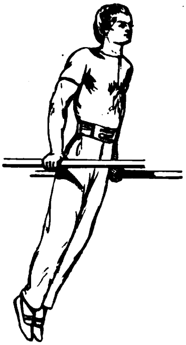


Fig. 14.



2. Grasp the bars right and left, press strongly from both hands, lean forward, straighten the arms and rise above the bars resting on the hands (Fig. 14).

To rise between the bars, both hands at once.

EXERCISE 13.
COURSE III.

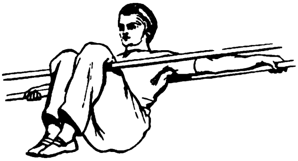
1. Spring from the ground until the breast is above the bars, seize both bars right and left, and immediately straighten the arms and come to the Rest on the hands above the bars.

To rise by the first bar and descend by the second.

From the position at the side of the bars.

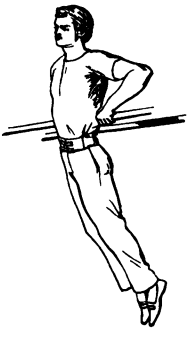
EXERCISE 14. COURSE III. 1. Grasp the first bar, the fingers and thumbs meeting; lift both feet from the ground, and pass them over the second bar, resting on it under the knees, the fore-legs pendent, the trunk of the body sustained, the head held back.

Fig. 15.



2. Pass the head and shoulders under the bar and rear them above it, resting on the back of the neck, quit the grasp of the right hand, bring the arm between the bars, and stretch it along the surface of the first bar, to the right, grasping the bar, the left hand following on the left bar (Fig. 15): gradually bring the hands together, along the bar, behind the back, and rise, seated on the second bar.

Fig. 16.



In descending, pass the right hand over to the second bar, the left following; reverse the grasp of both hands, elongate the trunk and lower limbs, setting the body free from the bar and resting sustained by the grasp of the hands in front of the bar (Fig. 16); gradually contract the arms, sink beneath the bar, and lower the feet to the ground.

To rise between the bars by the upstart.

EXERCISE 15. COURSE IV. 1. Raise both hands and grasp the bars inside, the backs of the hands inwards, the fingers and thumbs meeting. Raise the feet from the ground, letting the lower limbs swing slightly to the rear, and on the return oscillation towards the front raise the legs and feet straight and together to the level of the bars. Immediately on the commencement of the rearward swing in this position press strongly with the hands and, retaining them straight, rise to the Rest between the bars (Fig. 14), letting the lower limbs fall to the perpendicular position.

To rise between the bars by the upstart, by the upper arms.

EXERCISE 16. COURSE IV. 1. Spring from the ground till the shoulders are above the bars, spread out the folded arms horizontally and come to the Rest beneath the shoulders. Extend the arms along the bar.

2. Let the body swing slightly to the rear, and then again strongly to the front till the feet are at the level of the bars, bending at the waist. Immediately on the commencement of the rearward swing in this position, press strongly with the hands and, retaining the arms straight, rise to the Rest between the bars, letting the lower limbs fall to the perpendicular position.

To rise between the bars by the upper arms.

By the forward swing.

EXERCISE 17. COURSE IV. 1. Rise to the Upper Arm Rest as in the previous exercise.

2. Let the body swing slightly to the rear, and then again strongly to the front. At the moment when the lower limbs rise to the level of the bars, pull strongly with the hands, rapidly hollow the back and rise to the Rest between the bars, letting the lower limbs fall to the rear till the perpendicular position is reached.

To rise between the bars by the upper arms.

By the backward swing.

EXERCISE 18. COURSE IV. 1. Rise to the Upper Arm Rest as above described.

2. Let the body swing slightly to the front and then again strongly to the rear. At the moment when the legs rise to the level of the bars and the end of the oscillation is reached, press strongly with the hands, rapidly hollow the back, and rise to the Rest between the bars, letting the lower limbs fall to the front till the perpendicular position is reached.

VARIATION. The above three exercises are easier if performed from the forearm instead of the upper arm.

From the position of the Rest between the bars, the above exercises may be combined with any of the movements described as commencing with this position under the Parallel Bars, such as the Balances, Marches, &c.; with the exception that the descent cannot, of course, be made from the end of the bars.

APPENDIX TO THE MOVEABLE PARALLEL BARS.

First Series.

To vault over the bars between the hands.

EXERCISE 19. 1. Grasp the nearer bar with the hands at the distance, the fingers and thumbs meeting, the thumbs beneath, bend the legs and, on the return extension, spring from the ground, press strongly with the hands, incline the head and shoulders forward, extend the arms and bring the knees straight up between them. Shoot the feet through the space between the hands, press from the hands strongly and descend yielding beyond the further bar.

VARIATION. An easier form of this exercise may be performed from the further bar. In this case the lower limbs must be elevated by the back lift till almost perpendicular, and then brought smartly between the hands to the ground.

To vault over the bars, the legs astride.

EXERCISE 20. 1. Grasp the further bar and elevate the lower limbs by the rear well above the bars. At this point open the legs to their full extension, inclining the head and shoulders upwards; and as the legs are shot in position over the bars, press strongly with the hands, and bringing the legs rapidly together descend yielding beyond the further bar.

VARIATION. This exercise may be varied by grasping the nearer bar, separating the legs on the spring from the ground as in the similar vault over the single bar (p. 97), quickly shifting the hands in position to the second bar and descending beyond it.

To vault over the bars by the back lift.

EXERCISE 21. 1. Grasp the nearer bar, the fingers and thumbs meeting, press strongly with the hands and feet simultaneously and elevate the body to a vertical position above the nearer bar, the arms bending during the ascent, the elbows held close in by the side, the head and shoulders inclined to the front and being depressed between the bars. From this point let the feet pass to the front, sharply bend the back inwards, and, pressing firmly from the hands and extending the arms, descend to the ground yielding on the other side of the further bar.

The exercise is easier when performed from the single bar.

THE TRAPEZIUM.

In importance this machine ranks high, not so much on account of the number of its exercises as from their artistic character, and the power which they possess of testing and increasing the capacity of the trunk and upper limbs.

Every exercise on this machine consists of one or more evolutions of less or greater difficulty, of which the hand-grasp on the rope or the bar, or on both, forms the centre, the entire weight of the body and force of the movement being sustained by it. They all terminate on the spot, and in the position, in which they begin.

It is obvious that a considerable number of the exercises performed on the bar alone, without employment of the ropes, are common to this machine with the horizontal bar. Thus it is possible to rise above the steady bar with one leg acting in a manner precisely similar to that on the Horizontal Bar; so also upstarts and other exercises of the Horizontal Bar may be performed upon the trapezium in the swing. In order therefore to avoid confusion and repetition, such exercises only are given under the trapezium as appear more especially to apply to this machine, or to be better acquired in the first instance upon it; whilst all exercises performed with the trapezium in the swing have been avoided, the simpler ones possessing no advantage over those on the steady machine, the more difficult ones being dangerous and outside the province of educational gymnastics. A short list of the best known amongst the latter will be found in the Appendix to the Trapezium.

The exercises on the trapezium divide themselves into two series—in those of the first, the *ropes* are grasped by either one or both hands; in those of the second, the ropes are carefully avoided and the grasp of the hands is on the *bar* alone.

All these exercises may be practised by beginners, the form of each, given in the text, being the perfect one, but capable of modification for initiatory practice. Thus in introducing a beginner to the first exercise, instead of grasping the rope a hand's-breadth above the bar, he may grasp it a foot or even more above the bar, the left hand following close under the right, and then day by day the space between the hands and the bar should be reduced, until these are placed as directed in the text. The same course may be literally followed in the second exercise. In the third and fourth, the initiatory practice may be accompanied by a spring from the ground, which should be gradually lessened until the effort falls entirely upon the upper limbs, as indicated in the text. In the fifth the limbs should be supported and guided by the instructor, this support being gradually withdrawn, until the learner can execute the movements without help.

The exercises of the second series are all more arduous, but also admit of gradual approach. In Exercise 6 a slight spring may be taken, and both arms and legs allowed to remain bent; the spring may then be dispensed with; next, the legs may remain bent at the commencement, and be extended during the rise; to be followed by the straight leg and bent arm, leading direct to the perfect exercise. In Exercise 7 the gradations by which it may be approached are less marked; it may be viewed as commencing where the second exercise in the first series terminates, and there is no intermediate practice; nothing but perseverance against repeated failures will overcome the difficulty, for the position is not such as will admit of direct help from the instructor, and all that can be given in this exercise must be but the steadying of the limbs, enabling the learner to hold his own. Exercises 9 and 10 have no gradations on this machine, but may be approached here by practice on others, such as the Horizontal Bar, where, on account of such machines being fixed and firm, they are less difficult. Exercise 11 may be approached by practice on a machine that turns with the hand, such as the Pair of Rings. Exercises 12 and 13 are always found to be among the most difficult on this machine, and require the greatest care in their execution; the pause in the horizontal line should never exceed a few seconds. The variation sometimes performed, of passing from the backward horizontal line over the bar in position, should never be allowed with young people or beginners, as it is for them highly dangerous.

The best grasp for the instructor in directing the evolutions on the trapezium is a firm hold of the wrist with the left hand, the right firmly grasping the leg of the trowsers at the ankle.

The position of the instructor should be on the right or left of the machine, facing the learner.

The bar of the trapezium should be 2 feet 6 inches long and 1½ inch in diameter, and suspended at a height of 4 feet 6 inches from the floor.

First Series . . . *Employing the ropes.*
Second Series . . . *Employing the bar only.*

Position (except in the case of the first exercise) of attention facing the trapezium.

First Series.

To rise by the single rope.

EXERCISE I.
COURSE I.

Position of attention, the trapezium in profile on the left.

1. Raise the right hand and grasp the rope a hand's-breadth above the bar, the left following in the interspace (Fig. 1).

2. Lift both feet from the ground, the legs straight and together, the toes pointed to the front, and pass them over the bar, elevating the body until the hip rests on its surface (Fig. 2); press downwards with the hands and rise seated on the bar, retaining the grasp of the rope (Fig. 3).

Fig. 1.

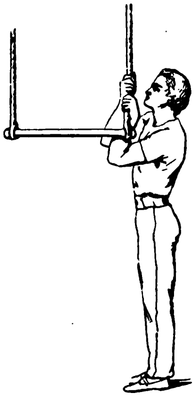


Fig. 2.

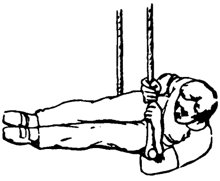
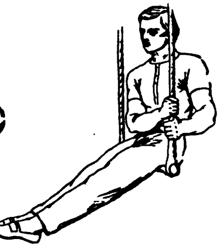


Fig. 3.



In descending, lean slowly backwards and sidewards, bringing the hip again on the bar, remove the lower limbs from it, and come to the first position.

This exercise to be repeated with the trapezium on the right, the left hand uppermost.

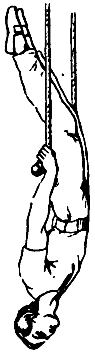
To rise by both ropes.

EXERCISE 2.
COURSE I.

1. Raise both hands and grasp the ropes, one in each hand, close to the bar.

2. Lift both feet from the ground, and pass them under the bar between the hands, at the same time allowing the head and shoulders to fall backwards and straightening the arms; and by a continuous movement bend the back inwards, and extend the lower limbs upwards (Fig. 4), bending the arms until the hips are as high as the bar; slowly let the feet descend to the front, and at the same time and at the same pace let the trunk, shoulders, and head ascend, and come to the seat on the bar, retaining the grasp. During this last movement let the chin be elevated, the shoulders pressed back, the breast advanced square to the front.

Fig. 4.



In descending, lower the body from the bar backwards, let the lower limbs fall to the rear, re-pass the feet under the bar, and come to the first position.

To rise by the bar and rope.

EXERCISE 3.
COURSE I.

1. Raise the right hand to the reach and grasp the rope, raise the left hand and grasp the bar at its centre.

2. Lift both feet from the ground, the toes pointed downwards, by the flexion of the right arm and the extension of

the left, and rise until the face is as high as the right hand, the left arm straight above the hand grasping the bar (Fig. 5); turn to the right, the back to the bar, and sit in the space between the left hand and the right rope (Fig. 6), retaining the grasp.

Fig. 5.

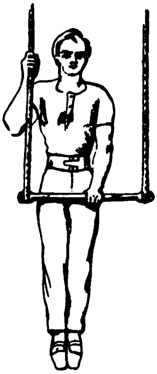
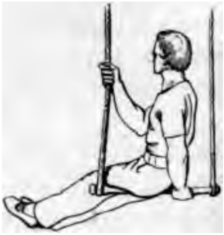


Fig. 6.



In descending, raise the body and return the face to the bar, lower the body slowly to the ground.

This exercise to be repeated with the left hand on the rope.

To rise by the bar and rope.

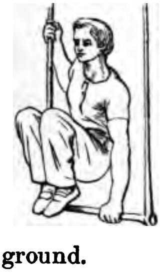
By the front lift.

EXERCISE 4.
COURSE II.

1. Proceed as in the previous exercise until the left arm is straight above the bar (Fig. 5).

2. Raise the feet and pass them over the bar through the space between the left hand and the right rope (Fig. 7), extend the legs, point the toes to the front, and come to the seat on the bar, retaining the grasp.

Fig. 7.



In descending, withdraw the feet through the interspace, and slowly lower them to the ground.

This exercise to be repeated with the left hand on the rope.

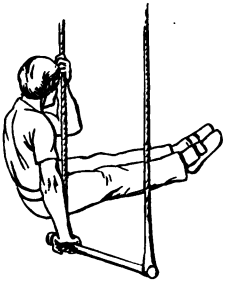
The exercise may be varied by allowing the lower limbs to fall to their full extension on the further side of the bar, after passing them over it, and thence again raising them to the seat on the bar.

To turn round the ropes, right and left.

EXERCISE 5.
COURSE II.

1. Proceed to the seat on the bar as in the previous exercise.

Fig. 8.



2. Raise the left hand from the bar and grasp the right rope as high as the face, slip the right hand down to the bar, and grasp it close to the rope with the thumb to the front, the fingers to the rear; lift the body from the bar, pass round the outside of the right rope, the feet leading (Fig. 8), pass the lower limbs between the ropes, and again come to the seat on the bar.

3. Repeat the movement round the left rope, reversing the respective positions of the hands.

Descend as in the previous exercise.

Second Series.

To turn round the bar forwards.

EXERCISE 6.
COURSE III.

1. Raise both hands and grasp the bar, the hands at the distance, the backs of the hands upwards, the fingers and thumbs meeting; extend the lower limbs to the front, at the same time sinking to the reach of the hands; the legs together and straight, the feet together with the toes pointed to the front (Fig. 9).

2. Lift the feet from the ground, the lower limbs in position, the arms remaining perfectly straight, until the feet are as high as the bar (Fig. 10); bend the arms, and at the same time elevate the body until the waist is as high as the

bar, pass the lower limbs over the bar, the trunk following, revolving on the waist (Fig. 11), lower the body, completing the circle, and slowly descend until the feet meet the ground; relinquish the grasp of the hands.

Fig. 9.

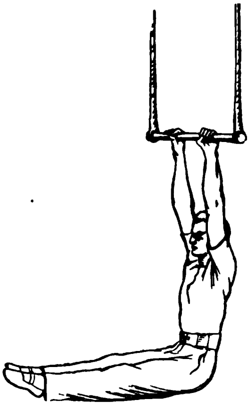


Fig. 10.

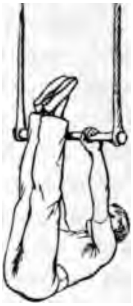
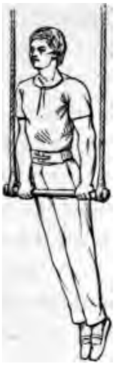


Fig. 11.



To turn round the bar backwards.

EXERCISE 7.
COURSE III.

1. Grasp the bar, sink to the reach and extend the lower limbs to the front as in the previous exercise.

2. Proceed as in the previous exercise until the feet are as high as the bar (Fig. 10); pass the feet under the bar between the hands, and by a continuous movement bend the back inwards and extend the lower limbs upwards, bending the arms until

Fig. 12.

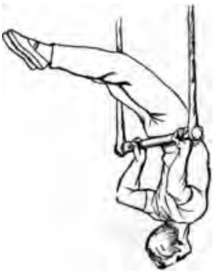
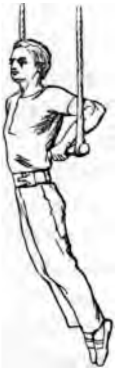


Fig. 13.



the waist is as high as the bar (Fig. 12), let the lower half of the body slowly fall to the front, and as it descends let the upper half ascend in position, the head well thrown back, and sink slowly down, the back touching the bar (Fig. 13), until the feet meet the ground; relinquish the grasp of the hands.

To turn round the bar backwards and return.

EXERCISE 8.
COURSE III.

1. Complete the previous exercise.

2. Instead of relinquishing the grasp, press from the hands, straighten the arms, bending the back inwards, and rise to the seat on the bar; slowly let the head and shoulders fall to the rear, re-pass the feet under the bar, straighten the legs, lower the body, and return to the first position.

To rise above the bar right and left.

EXERCISE 9.
COURSE III.

1. Grasp the bar, sink to the reach and elevate the lower limbs to the front as previously.

2. Lift both feet from the ground, bend the arms until the breast is as high as the bar, press strongly with the right hand upon the bar and raise the forearm vertically above it (Fig. 14); repeat the movement with the left hand, complete the extension of both arms, and come to the upright position, resting on the bar (Fig. 15).

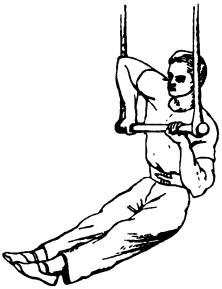


Fig. 14

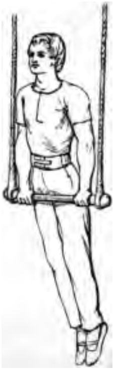


Fig. 15.

In descending, re-bend the right arm, and pass it below the bar, the left following, lower the body and come to the first position.

This exercise to be repeated left and right.

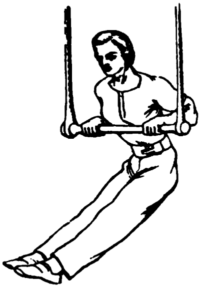
To rise above the bar both hands at once.

EXERCISE 10. COURSE IV. 1. Grasp the bar, sink to the reach, and elevate the lower limbs to the front as previously.

2. Lift both feet from the ground, bend the arms until the breast is as high as the bar, press strongly upon the bar with both hands at once and rise above it (Fig. 16), completing the extension of the arms, and come to the upright position, resting on the bar, as in Fig. 15.

This series of movements to be executed without pause, and at the same pace throughout.

Fig. 16.



In descending, re-bend the arms, pass them below the bar, and come to the first position.

To turn under the bar on one hand.

EXERCISE 11. COURSE IV. 1. Grasp the bar and elevate the lower limbs to the front as previously.

2. Elevate the lower limbs, until the feet are as high as the bar (Fig. 10); pass the feet under the bar between the hands, and let them descend close to the ground, but without touching it (Fig. 17); quit the grasp

he left hand, at the same time folding the lower limbs e under the body, swinging round the right, make complete turn rally, and again e to the front . 18); re-grasp bar with the left d, extend the legs, n raise the feet he bar and re- them under it; the grasp with right hand, swinging round by the left; re-grasp the with the right hand, extend the legs and come to the position.

Fig. 17.

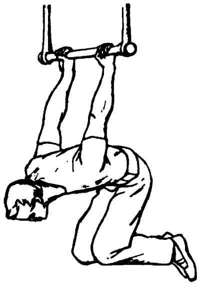
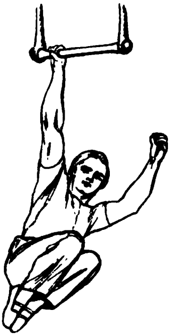


Fig. 18.



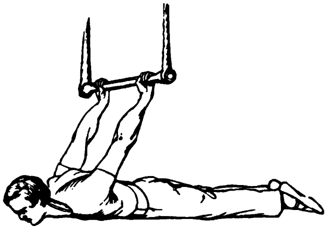
To form the straight line backwards.

CISE 12.
SE IV.

1. Proceed as in the previous exercise until the feet are ed under the bar.

Extend the legs to the and pause, forming a ectly horizontal line head to foot, suspend- y the arms under the (Fig. 19); relax the nsion, re-pass the feet r the bar, extend the legs to the front, and come to the position.

Fig. 19.



In descending, re-bend the right arm, and pass it below the bar, the left following, lower the body and come to the first position.

This exercise to be repeated left and right.

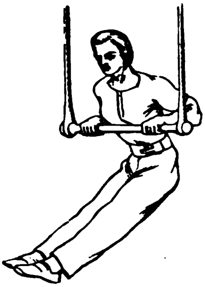
To rise above the bar both hands at once.

EXERCISE 10. COURSE IV. 1. Grasp the bar, sink to the reach, and elevate the lower limbs to the front as previously.

2. Lift both feet from the ground, bend the arms until the breast is as high as the bar, press strongly upon the bar with both hands at once and rise above it (Fig. 16), completing the extension of the arms, and come to the upright position, resting on the bar, as in Fig. 15.

This series of movements to be executed without pause, and at the same pace throughout.

Fig. 16.



In descending, re-bend the arms, pass them below the bar, and come to the first position.

To turn under the bar on one hand.

EXERCISE 11. COURSE IV. 1. Grasp the bar and elevate the lower limbs to the front as previously.

2. Elevate the lower limbs, until the feet are as high as the bar (Fig. 10); pass the feet under the bar between the hands, and let them descend close to the ground, but without touching it (Fig. 17); quit the grasp

To turn round the bar backwards and return—to rise above the bar, both hands at once. (Ex. 8, 10.)

To turn round the bar backwards and return—to turn under the bar on one hand. (Ex. 8, 11.)

To turn round the bar backwards and return—to form the straight line. (Ex. 8, 12.)

To rise above the bar both hands at once—to turn under the bar on one hand. (Ex. 10, 11.)

To rise above the bar both hands at once—to form the straight line. (Ex. 11, 12.)

To rise above the bar both hands at once—to form the straight line forwards. (Ex. 11, 13.)

Combinations of three exercises.

To turn round the bar forwards—to turn round the bar backwards and return—to rise above the bar, both hands at once. (Ex. 6, 8, 10.)

To turn round the bar forwards—to rise above the bar, both hands at once—to turn under the bar on one hand. (Ex. 6, 10, 11.)

To turn round the bar forwards—to rise above the bar both hands at once—to form the straight line. (Ex. 6, 10, 12.)

To turn round the bar forwards—to turn under the bar on one hand—to form the straight line. (Ex. 6, 11, 12.)

To rise above the bar both hands at once—to turn round the bar backwards and return—to form the straight line. (Ex. 10, 8, 12.)

To turn round the bar backwards and return—to turn on one hand under the bar—to form the straight line forwards. (Ex. 8, 11, 13.)

To turn round the bar backwards and return—to turn under the bar on one hand—to rise above the bar both hands at once. (Ex. 8, 11, 10.)

Combinations of four exercises.

1. To turn round the bar forwards—to turn round the bar backwards and return - to rise above the bar both hands at once – to turn under the bar on one hand. (Ex. 6, 8, 10, 11.)
2. To turn round the bar forwards—to rise above the bar both hands at once—to turn under the bar on one hand—to form the straight line forwards. (Ex. 6, 10, 11, 13.)
3. To turn round the bar backwards and return—to rise above the bar both hands at once—to turn round the bar forwards—to form the straight line. (Ex. 8, 10, 6, 12.)
4. To rise above the bar both hands at once—to turn round the bar backwards and return—to turn under the bar on one hand—to turn round the bar forwards. (Ex. 10, 8, 11, 6.)

Combinations of five exercises.

1. To turn round the bar forwards—to turn round the bar backwards and return—to rise above the bar both hands at once—to turn under the bar on one hand—to form the straight line. (Ex. 6, 8, 10, 11, 12.)
2. To turn round the bar backwards and return—to rise above the bar both hands at once—to turn round the bar forwards—to turn under the bar on one hand—to form the straight line forwards. (Ex. 8, 10, 6, 11, 13.)
3. To rise above the bar both hands at once— to turn round the bar backwards and return—to turn round the bar forwards—to rise above the bar both hands at once—to form the straight line. (Ex. 10, 8, 6, 10, 12.)

APPENDIX TO THE TRAPEZIUM.

THE trapezium is the machine *par excellence* for learning to preserve the equilibrium on an unsteady bar; and though such exercises require no description in this place, as having no bearing on physical education proper, they are sometimes of practical use to individuals, and therefore the more usual methods of balancing are enumerated. Rising by one of the usual methods to the seat, and thence to the stand on the bar by means of the ropes, it is possible to acquire the art of balancing without the use of the hands,

1. On both feet.
2. With one foot extended to the front.
3. Sideways on both feet.
4. Sideways on one foot.

From the seat on the bar, it is possible to balance oneself,

5. Upon the bar backwards in a straight line, the arms extended beyond the head.

From the Rest it is possible,

6. To rest on the bar forwards upon the waist, the arms pendent, as in Ex. 16 of the beam.
7. To swing up to the short-arm or straight-arm balance, the feet resting on the ropes.
8. To swing up to the balance without the use of the ropes.

From each of the standing Exercises 1, 2, 3, 4, the descent is again made to the seat on the bar and thence to the ground. From No. 5 drop to the hocks, and thence swing off as described under the Horizontal Bar. From No. 6 again come to the Rest and thence to the ground. From Nos. 7 and 8 bring the feet together and let the lower limbs sweep over the head to the ground, retaining a firm grasp of the bar.

The swinging trapeze.

Many of the exercises described in the System may be performed, and moreover safely performed, in the swing, requiring often a little more effort and skill, but possessing no advantage physically over those on the steady machine. The swinging trapeze is therefore abandoned by common consent to the acrobat, or resorted to only in displays and exhibitions for the purposes of effect. These exercises consist almost entirely of finishes in the shape of somersaults, fraught with considerable danger in their acquirement; and it will be sufficient therefore here to give a short list of the best known.

1. The *Backaway* is a hollow-back back somersault at the end of the forward swing.
2. The *Forwardaway* is a hollow-back forward somersault at the end of the back swing.

By reversing these processes we have what is sometimes termed

3. The *Backward Backaway*, a back somersault at the end of the back swing.
4. The *Forward Forwardaway*, a front somersault at the end of the forward swing.
5. *Hock-swing off*, at the end of the front swing.
6. *Hock-swing off*, at the end of the back swing.

It is of course possible to *change front* during the swing, quitting the grasp of one hand, passing beneath the bar, retaking the bar, and reversing the grasp of the other hand.

THE PAIR OF RINGS.

THIS machine is similar in character to the trapezium. giving a wide course of exercises, passing from the most simple to the most arduous. Like the exercises of the trapezium, they powerfully address themselves to the trunk, especially its upper region, and to the arms.

With this machine also, the exercises are all given in the text in their perfect form, and allow of gradual approach through less difficult movements and positions. The first and second may be begun not only while standing upright and with the arms bent, but a spring may be taken with the feet to assist in the elevation of the lower limbs, and the knees may remain bent both in the ascent and descent, to front and rear; these modifications of the exercise being gradually relinquished as the body acquires strength, until it can be executed in its perfect form. The first part of the fifth exercise may be similarly modified, but its distinguishing feature, that of turning the body while the feet remain in the rings, must always be executed slowly, the back sinking gradually, with every joint of the spine sharing equally in the depression, and the chest gradually rounding and expanding under the same influence.

In the second series, many of the exercises lead direct to each other, and these may be modified, first, by being begun from the erect standing position, and next from the kneeling position.

In the third series, performed above the rings, the simplest method of rising above the rings is given in the text; but any of the other methods may of course be adopted at the discretion of the instructor.

The swinging trapeze.

Many of the exercises described in the System may be performed, and moreover safely performed, in the swing, requiring often a little more effort and skill, but possessing no advantage physically over those on the steady machine. The swinging trapeze is therefore abandoned by common consent to the acrobat, or resorted to only in displays and exhibitions for the purposes of effect. These exercises consist almost entirely of finishes in the shape of somersaults, fraught with considerable danger in their acquirement; and it will be sufficient therefore here to give a short list of the best known.

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6. *Hock-swing off*, at the end of the back swing.

It is of course possible to *change front* during the swing, quitting the grasp of one hand, passing beneath the bar, retaking the bar, and reversing the grasp of the other hand.

the legs together and straight, the feet together, the toes pointed to the front (Fig. 1).

2. Lift both feet from the ground, and pass them between the rings, the arms and legs straight throughout (Fig. 2); slowly descend to the ground, completing the circle (Fig. 3), and relinquish the grasp.

Fig. 1.

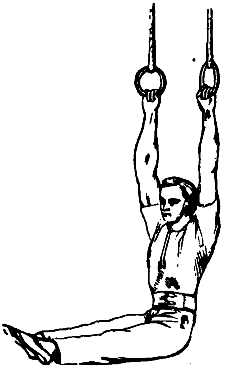


Fig. 2

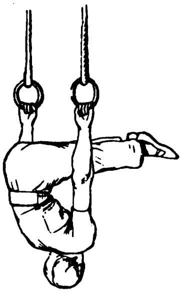
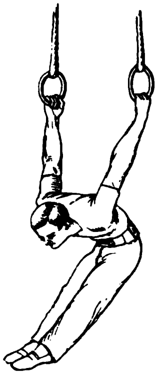


Fig. 3.



The double circle.

EXERCISE 2.
COURSE II.

1. Complete the previous exercise to the termination of the single circle.

2. Instead of relinquishing the grasp of the hands, return between the rings and come to the first position, retaining the arms and legs straight throughout. Bend the arms, replace the feet upon the ground under the rings, and quit the grasp.

The single circle.

The back hollow.

EXERCISE 3.
COURSE IV.

1. Immediately on grasping the rings curve the back inward, throwing the head well back and keeping the feet to the rear.

2. Lift both feet from the ground and bring them to the

front, retaining the back curved and the arms straight, and so pass them between the rings; slowly descend to the ground, completing the circle, and relinquish the grasp.

Fig. 4.

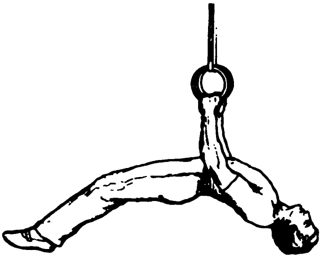
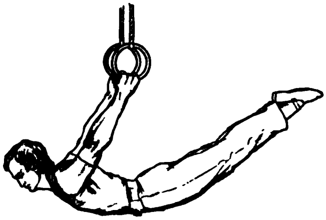


Fig. 5.



The double circle.

The back hollow.

EXERCISE 4.
COURSE IV.

1. Proceed as in the previous exercise to the completion of the single circle.

2. Instead of relinquishing the grasp of the hands, return between the rings and come to the first position, retaining the arms straight and the back curved throughout. Bend the arms, replace the feet beneath the rings, and quit the grasp.

To turn with the feet in the rings.

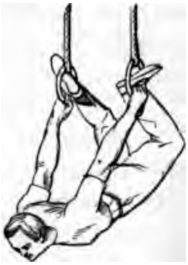
EXERCISE 5.
COURSE II.

1. Proceed as in the single circle till the feet are between the rings; separate the feet right and left, and insert each in its respective ring.

2. Resume with the trunk of the body the action of the

circle, slowly separating the knees, lowering and arching the back and raising the head (Fig. 6).

Fig. 6.



3. Re-raise the trunk to its position at the half-circle, remove the feet from the rings, straighten the legs, point the toes upwards and let them gradually descend to the front, the arms straight, and come to the first position.

To turn on one hand right and left.

EXERCISE 6. COURSE III.

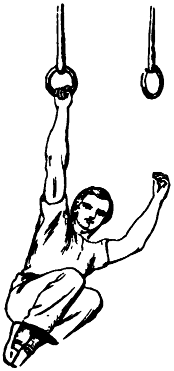
1. Complete the single circle.

2. Instead of relinquishing the grasp with both hands, retain the grasp of the right, passing the left arm down by the side, and folding the lower limbs under the body.

3. Make a complete turn laterally from left to right, re-grasp the ring with the left hand (Fig. 7), and extend the lower limbs to the front as in first position.

4. Re-pass the feet between the rings, repeat the turn from right to left retaining the grasp of the left hand, regrasp the ring with the right, extend the lower limbs to the front and come to the position.

Fig. 7.



To extend the arms right and left.

EXERCISE 7. COURSE II.

1. Grasp the rings, lower the body to the reach of the hands and pass both feet to the front, the legs and feet together, the toes pointed to the front (Fig. 1).

2. Gradually bend the arms to their full extent, raising the lower limbs in position; sustain the body on the left hand (retaining it close by the side), extend the right arm holding the ring at the full length of the arm (Fig. 8), pause, and return the right hand to the side; repeat the extension with the left arm, pause, return it to the side, lower the body and come to the position.

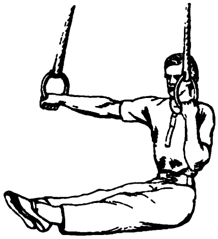


Fig. 8.

To form the straight line backwards.

EXERCISE 8.
COURSE IV.

1. Proceed as in the single circle till the feet are between the rings (Fig. 2).

2. Instead of lowering the feet to the ground, extend them to the rear until the lower limbs and trunk form one perfect horizontal line (Fig. 9).

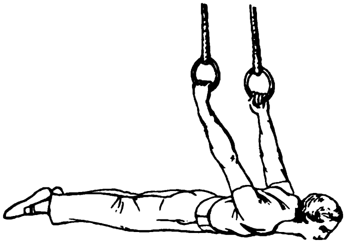


Fig. 9.

Relax the extension of the lower limbs, let the feet descend to the rear, and come to the position.

To form the straight line forwards.

EXERCISE 9.
COURSE IV.

1. Grasp the rings; raise the lower limbs to the front in position, the toes pointed to the front, allowing the head and shoulders to fall to the rear, the arms slightly bent, until the lower limbs and trunk form one horizontal line.

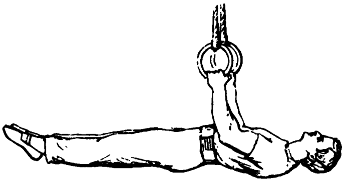


Fig. 10.

Relax the extension, let the feet descend to the ground, *and come* to the position.

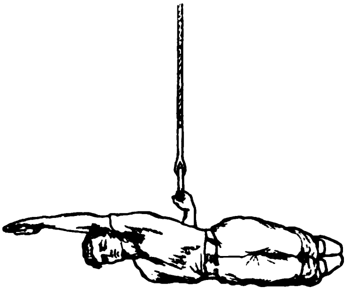
To form the straight line on one arm.

EXERCISE 10.
COURSE IV.

1. Proceed as in the ordinary circle, round or hollow back, till the feet are above the head between the rings.

2. At this point incline the body to the right, supporting it upon the right arm by allowing the small of the back to rest on the right forearm. Quit the grasp of the left hand and extend the arm to the front above the head (Fig. 11).

Fig. 11.



Resume the grasp of the left hand, bring the lower limbs once more between the rings and descend to the front.

This exercise to be repeated on the left arm.

Second Series.

Position of attention between the rings.

To rise above the rings right and left.

EXERCISE 11.
COURSE III.

1. Grasp the rings and pass both feet to the front as previously (Fig. 1).

2. Bend the arms, raising the lower limbs in position, press strongly on the ring with the right palm, raising the forearm vertically above the ring (Fig. 12); repeat the move-

Fig. 12.

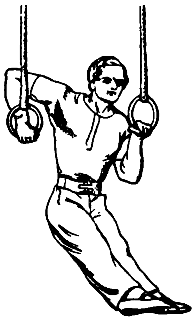
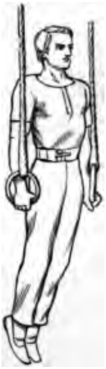
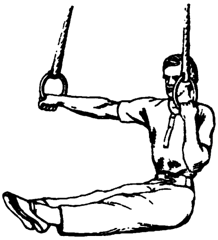


Fig. 13.



2. Gradually bend the arms to their full extent, raising the lower limbs in position; sustain the body on the left hand (retaining it close by the side), extend the right arm holding the ring at the full length of the arm (Fig. 8), pause, and return the right hand to the side; repeat the extension with the left arm, pause, return it to the side, lower the body and come to the position.

Fig. 8.



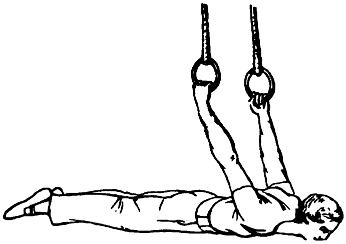
To form the straight line backwards.

EXERCISE 8.
COURSE IV.

1. Proceed as in the single circle till the feet are between the rings (Fig. 2).

2. Instead of lowering the feet to the ground, extend them to the rear until the lower limbs and trunk form one perfect horizontal line (Fig. 9).

Fig. 9.



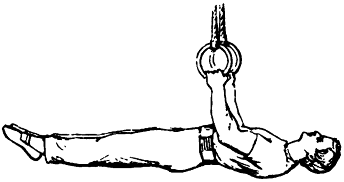
Relax the extension of the lower limbs, let the feet descend to the rear, and come to the position.

To form the straight line forwards.

EXERCISE 9.
COURSE IV.

1. Grasp the rings; raise the lower limbs to the front in position, the toes pointed to the front, allowing the head and shoulders to fall to the rear, the arms slightly bent, until the lower limbs and trunk form one horizontal line.

Fig. 10.



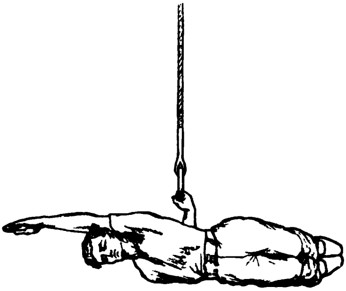
Relax the extension, let the feet descend to the ground, *and come* to the position.

To form the straight line on one arm.

EXERCISE 10.
COURSE IV.

1. Proceed as in the ordinary circle, round or hollow back, till the feet are above the head between the rings.

Fig. 11.



2. At this point incline the body to the right, supporting it upon the right arm by allowing the small of the back to rest on the right forearm. Quit the grasp of the left hand and extend the arm to the front above the head (Fig. 11).

Resume the grasp of the left hand, bring the lower limbs once more between the rings and descend to the front.

This exercise to be repeated on the left arm.

Second Series.

Position of attention between the rings.

To rise above the rings right and left.

EXERCISE 11.
COURSE III.

1. Grasp the rings and pass both feet to the front as previously (Fig. 1).

Fig. 12.

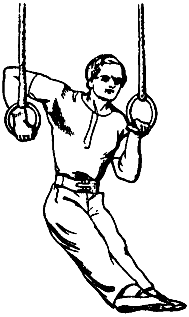
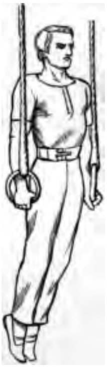


Fig. 13.



2. Bend the arms, raising the lower limbs in position, press strongly on the ring with the right palm, raising the forearm vertically above the ring (Fig. 12); repeat the move-

ment on the left, press strongly with both hands, straighten the arms completely above the rings and pause (Fig. 13); the chest fully advanced, the head held back, the chin elevated, the legs straight and together, the toes pointed to the ground.

In descending, re-bend the right arm, the left following, re-pass the right below the ring, the left following, lower the body and come to the position.

This exercise to be repeated with the left hand leading.

To rise above the rings both hands at once.

EXERCISE 12.
COURSE IV.

1. Grasp the rings, placing the hands well through till the base of the palm rests upon them, and pass the feet to the front as previously.

2. Bend the arms, instantly press strongly on the rings with both hands, and raise both arms vertically above the rings (Fig. 14), and rise above the rings to the full extension of the arms (Fig. 15), the transition from the bent to the extended position of the arms taking place without pause.

Fig. 14.

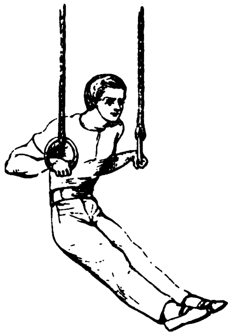
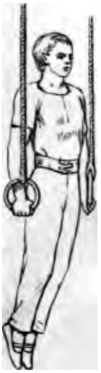


Fig. 15.



In descending, re-bend both arms at once, pass them below the rings, lower the body and come to the position.

To rise above the rings backwards, right and left.

EXERCISE 13. 1. Complete the single circle.
COURSE IV. 2. Elevate the right side, lean slightly forward, press strongly with the right hand, and raise the forearm vertically above the ring (Fig. 16); repeat the movement on the left, press strongly with both hands, and rise above the rings, the arms at full extension (Fig. 17).

Descend as in the previous exercise.

This exercise to be repeated with the left hand leading.

Fig. 16.

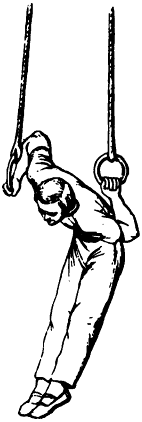
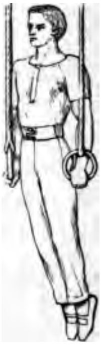


Fig. 17.



To rise above the rings backwards, both hands at once.

EXERCISE 14. 1. Grasp
COURSE IV. the rings, the hands well through, and pass the feet to the front as previously.

2. Lift both feet from the ground and pass them between the rings, and at the same time rapidly bend the arms, raising the body between the rings until the hands are close at the sides, instantly press with both hands and raise the forearms vertically above the rings (Fig. 18), straighten the arms, continue the movement of the circle with the lower limbs, and let the body rise between the rings, the arms at full extension (Fig. 19).

Fig. 18.

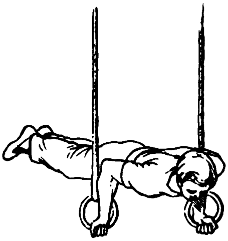
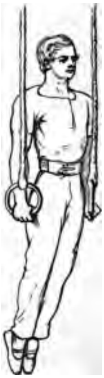


Fig. 19.

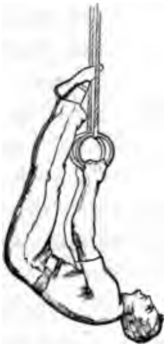


To rise above the rings by the forward circle.

EXERCISE 15.
COURSE IV.

1. Grasp the rings, placing the hands well through them until each ring crosses the 'heel' of the hand; shoot the legs forward and upward so as to bring them above the head between the rings (Fig. 20); at the point when they are perpendicular above the head instantly hollow the back, press firmly downwards upon the hands, and rise with both the arms above the rings, the lower limbs descending and completing the circle and the arms rising to their full extension as in Fig. 19.

Fig. 20.



COURSE IV.

The above exercise may be performed with the back hollow throughout, the body being curved inwards at the commencement of the exercise, on grasping the rings.

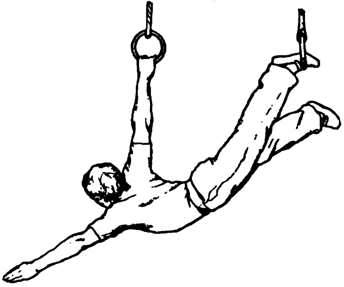
To rise above the rings by the foot and hand.

EXERCISE 16.
COURSE IV.

1. Elevate the lower limbs as in the ordinary circle, till the feet reach the rings.

2. Immediately separate the legs and place the right foot in the right ring, till the instep rests firmly within it. Quit the grasp of the right hand and let the left leg pass over the trunk of the body, turning the body round until the chest is downwards, and hollowing the back (Fig. 21).

Fig. 21.



2. Strongly pull with the left arm, keeping it close to the chest, until it is fully bent (Fig. 22). Now, turning the left elbow outwards, press strongly downwards with it upon the ring, and rise above the rings to the position of Fig. 23.

Fig. 22.

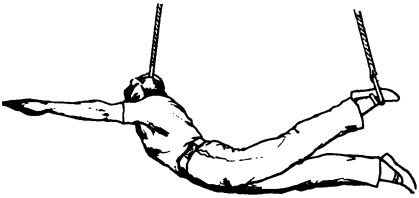
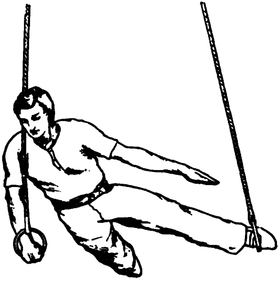


Fig. 23.



In descending, reverse the above movements.

Third Series.

Position of attention between the rings.

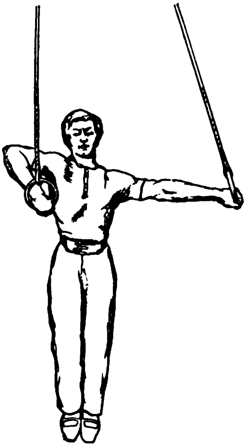
To extend the arms above the rings.

EXERCISE 17.
COURSE IV.

1. Rise above the rings right and left, and thence again slowly re-bend the arms (Bent Arm Rest).

2. Sustain the weight of the body on the left arm, retaining it close by the side, gradually extend the right arm laterally, until the ring is held at the full length of the arm; pause, and slowly return the right arm to the side. Repeat the extension with the left arm, pause, and return it to the side, and descend as previously.

Fig. 24.

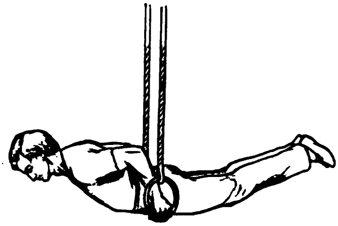


To form the straight line above the rings.

EXERCISE 18. COURSE IV. 1. Rise above the rings right and left to the full elevation of the arms (the Rest above the rings).

2. Slightly bend the arms, pressing them against the sides, incline the head and shoulders to the front, and bending the rings inwards to form a support for the trunk, press up with the lower limbs from the rear, until the head and feet are in horizontal line, the back curved inwards.

Fig. 25.



In descending, let the lower limbs fall slowly beneath the rings, the arms returning to the position of the Rest. Bend the arms and sink to the ground.

COURSE IV. The above exercise may be performed with the body in the hollow-back position throughout. In this case the method of 'pressing up' must be discarded for the 'swing up,' the back being curved inwards whilst still in the position of the Rest. Whilst the head and shoulders are being inclined forward, immediately swing the lower limbs up in position from the rear and hold the balance.

VARIATION. It is possible to circle up into the position of the straight line by proceeding as described in the circle into rest (Ex. 15); but instead of allowing the lower limbs to fall to the rear to the position of the Rest, pause when they are in a horizontal line with the head, and retain the balance.

To turn over above the rings.

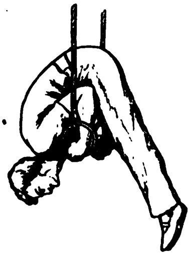
The front roll.

EXERCISE 19.
COURSE IV.

1. Rise above the rings right and left to the Rest above the rings.

2. Incline the head and shoulders forward, at the same time bending the arms and rounding the back. Now let the trunk fall forwards (Fig. 26); elevate the lower limbs by the rear, and continuing the movement, by pressing strongly downwards on the hands, complete the circle and rise once more to the position of the Rest. Descend as usual.

Fig. 26.



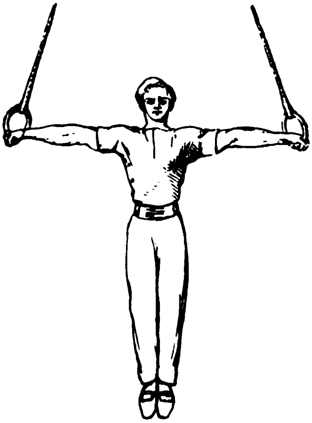
To extend both arms at once, above the rings.

EXERCISE 20.
COURSE IV.

1. Rise above the rings right and left.

2. Slowly let the whole body descend in position between the rings, at the same time extending the arms perfectly straight right and left, strongly pressing downwards with the palms, until the arms are at right angles with the body (Fig. 27); relax the extension and slowly lower the feet to the ground, and come to the position.

Fig. 27.



To stand above the rings.

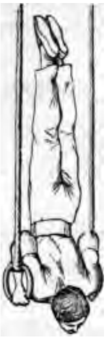
EXERCISE 21.
COURSE IV.

1. Rise above the rings right and left.

2. Incline the head and shoulders to the front, bending the arms and pressing them both close in by the sides, and at the same time raise the lower limbs in position by the rear until they are above the head, forming with the trunk of the body one perfect vertical line between the rings (Fig. 28).

In descending, relax the extension and bring the lower limbs down to the ground by the front as before.

Fig. 28.



To stand above the rings.

The arms straight.

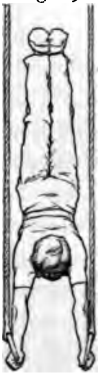
EXERCISE 22.
COURSE IV.

1. Complete the previous exercise.

2. Press strongly with the hands and wrists down upon the rings and rise to the full extension of the arms.

Re-bend the arms and descend as in the previous exercise.

Fig. 29.



VARIATION.
COURSE IV.

It is possible to perform the above exercise retaining the body in the hollow-back position throughout. Whilst in the position of the hollow-back Rest, swing the body slightly forwards and then back, and pressing firmly on the hands throw the lower limbs at once above the head, the arms remaining at full extension throughout, and retain the balance. This exercise is very much more arduous than the foregoing one, as the slight swing makes the ring oscillate and thus destroys the security of the balance.

To extend the arm in the stand above the rings.

EXERCISE 23.
COURSE IV.

1. Come to the stand above the rings as previously described (Fig. 28).

2. Sustain the body on the left arm, keeping it close to the side, and gradually extend the right arm laterally until the ring is held at the full length of the arm. Pause, and slowly return the right arm to the side. Repeat the extension with the left arm, and descend as usual.

Combinations of exercises.

When a number of these exercises can be performed singly, two, three, or more of them should be combined and executed without pause. The following are some of the combinations which may be made, and others can be formed at discretion.

Combinations of two exercises.

1. The double circle—to turn with the feet in the rings. (Ex. 2 or 4, 5.)
2. The double circle—to turn on one hand right and left. (Ex. 2 or 4, 6.)
3. The double circle—to rise above the rings backwards, right and left. (Ex. 2 or 4, 13.)
4. The double circle—to rise above the rings, both hands at once. (Ex. 2 or 4, 12.)

5. The double circle—to form the straight line backwards. (Ex. 2 or 4, 8.)
6. To extend the arms right and left—to form the straight line backwards. (Ex. 7, 8.)
7. To extend the arms right and left—to form the straight line forwards. (Ex. 7, 9.)
8. To extend the arms right and left—to rise above the rings both hands at once. (Ex. 7, 12.)
9. To rise above right and left—to turn on one hand. (Ex. 11, 6.)
10. To rise above both hands at once—to turn with the feet in the rings. (Ex. 12, 5.)
11. To rise above right and left—to form the straight line forwards. (Ex. 11, 9.)
12. To rise above both hands at once—to form the straight line on one arm. (Ex. 12, 10.)

Combinations of three exercises.

1. The double circle—to turn on one hand right and left—to extend the arms right and left. (Ex. 2 or 4, 6, 7.)
2. The double circle—to rise above the rings right and left—to turn on one hand right and left. (Ex. 2 or 4, 11, 6.)
3. The double circle—to rise above the rings backwards right and left—to rise above the rings both hands at once. (Ex. 2 or 4, 13, 12.)
4. The double circle—to rise above the rings both hands at once—to form the straight line above the rings. (Ex. 2 or 4, 12, 18.)
5. To rise above both hands at once—to extend the arms above the rings right and left—to form the straight line backwards. (Ex. 11, 17, 8.)
6. To rise above both hands at once—to extend the arms above the rings right and left—the front roll. (Ex. 12, 17, 19.)

7. To rise above by the forward circle—to extend the arms above the rings right and left—to form the straight line above the rings. (Ex. 15, 17, 18.)
8. To rise above backwards right and left—to turn on one hand right and left—to form the straight line above the rings. (Ex. 13, 6, 18.)
9. To rise above backwards both hands at once—the front roll—to rise above by the foot and hand. (Ex. 14, 19, 16.)
10. To extend the arms above the rings—the front roll—to stand above the rings. (Ex. 17, 19, 21.)
11. To rise above by the forward circle—the front roll—to extend the arms in the stand above the rings. (Ex. 15, 19, 23.)

Combinations of four exercises.

1. The double circle—to rise above the rings both hands at once—to turn on one hand right and left—to form the straight line backwards. (Ex. 2 or 4, 12, 6, 8.)
2. The double circle—to rise above the rings both hands at once—to form the straight line above the rings—to turn with the feet in the rings. (Ex. 2 or 4, 12, 18, 5.)
3. To rise above the rings by the forward circle—to form the straight line above the rings—the double circle—to form the straight line forwards. (Ex. 15, 18, 2 or 4, 9.)
4. To rise above the rings by the forward circle—the front roll—to extend the arms above the rings—to turn on one hand right and left. (Ex. 15, 19, 17, 6.)
5. To rise above the rings by the forward circle—to form the straight line forwards—to rise above the rings backwards, both hands at once—to form the straight line above the rings. (Ex. 15, 9, 14, 18.)
6. To form the straight line backwards—to rise above backwards right and left—the front roll—to extend both arms at once above the rings. (Ex. 8, 13, 19, 20.)

7. To extend the arms right and left—to rise above backwards both hands at once—to form the straight line above the rings—to stand above the rings, the arms straight. (Ex. 7, 14, 18, 22.)

Combinations of five exercises.

1. The double circle—to rise above the rings both hands at once—to turn on one hand right and left—to form the straight line backwards—to form the straight line above the rings. (Ex. 2 or 4, 12, 6, 8, 18.)
2. To rise above the rings both hands at once—to form the straight line above the rings—to turn with the feet in the rings—to extend the arms right and left—to form the straight line forwards. (Ex. 12, 18, 5, 7, 9.)
3. To extend the arms right and left—to turn on one hand right and left—to rise above the rings both hands at once—the front roll—to rise above by the foot and hand. (Ex. 7, 6, 12, 19, 16.)
4. To rise above by the foot and hand—to turn with the feet in the rings—to rise above the rings backwards, both hands at once—to extend the arms above rings right and left—to stand above the rings. (Ex. 16, 5, 14, 17, 21.)

APPENDIX TO THE PAIR OF RINGS.

The rings steady.

These exercises are merely finishes designed to vary the usual method of descent. They require care in practice and should never be attempted in the absence of the instructor except by the experienced. Though applicable to the steady rings, both the cutaway and back cutaway are easier in the swing.

The cutaway.

Grasp the rings lightly, and quickly elevate the lower limbs to the front, rapidly bending the arms and fully separating the legs during the rise; pass them over the head outside the rings, and when they come in contact with the wrists, quit the grasp, rapidly elevate the head backwards and drop yielding to the ground, the hands by the sides.

This exercise may also be performed with the back hollow throughout; in this case much more effort is required and the rise of the lower limbs between the rings must be effected very rapidly.

The back cutaway.

Grasp the rings lightly and quickly elevate the lower limbs to the front, rapidly bending the arms; without pause pass the legs, straight and together, over the head until they are in the position of Fig. 2. At this point rapidly separate them, and letting them drop smartly upon the wrists, quit the grasp and drop yielding to the ground, the hands by the sides.

The rings in the swing.

As in the case of the trapezium many exercises on this machine, previously described, may also be safely performed in the swing. The swinging rings are, however, almost always reserved for exhibition or tricky work and should not find a place in the System. A list of those most frequently practised is as follows:—

1. The *Cutaway* in the front swing.
2. The *Back Cutaway* in the back swing.

3. The *Cutaway* in the back swing.

4. The *Back Cutaway* in the front swing.

5. The *Cut and catch.* Perform the cutaway towards the end of the front swing, and rapidly re-grasp the returning rings.

6. The *Backaway.*

7. The *Forwardaway.*

8. The *Backward Backaway.*

9. The *Forward Forwardaway.*

The ordinary swing may be varied by reversing the positions of the body, movements more generally known by the exaggerated term 'dislocations.' These consist of—

10. *Reversal Backwards.* The legs are elevated over the head during the forward swing as for a circle, the arms being fully bent, and at the end of the backward swing are rapidly shot through the rings, the body being meantime reversed into the hollow-back position, and the swing forward commenced.

11. *Reversal Forwards.* Instead of shooting the legs over the head, the latter is rapidly elevated forwards and through the rings, the lower limbs descending and swinging to the rear.

12. *Hollow-Back Reversals,* in which the back is curved inwards throughout.

THE ROW OF RINGS.

Of the three exercises on this machine the first is a very simple one, and if the proper elevation of the rings from the floor be preserved, it may be safely practised without supervision, or at most with that of a monitor. It is not the less valuable on this account, but, on the contrary, it has a special object which it shares with the exercises of the next machine, viz. the equalization in strength and development of the two sides of the upper half of the body, and of the arms; for it necessitates that only one side can work at a time, and that the amount of exertion will be the same for each side, and that therefore the weaker side will actually do more, being the weaker, and consequently by the unerring law of development being in relation to activity, it will in time overtake and rank with its fellow in development and capacity.

The second and third exercises, which are favourites in Sweden, are considerably more arduous. Well performed, they are exceedingly graceful, and bring into play powerfully the muscles of the upper half of the body.

The row of rings should consist of not less than five or six rings similar to those described for the preceding machine, and there may with advantage be a greater number, if the length of the gymnasium will admit of it. They should be suspended at a height of not less than 6 feet 3 inches from the floor, and at equal distances apart, the distances in each case depending on the facilities offered by the building for attaching the ropes; but the distance apart should not be less than 8 feet or more than 10 feet, and the point to which the ropes are hung should never exceed 20 feet above the floor.

Single Series.

Position of attention facing the first ring, the back to the row.

The swing.

EXERCISE I.
COURSE II.

1. Raise the left hand and grasp the ring (Fig. 1), advance with short and rapid steps and springing from the ground at the end of the run, from the left foot, turn quickly to the right, bending the lower limbs at the knees and pointing the toes to the rear, the head erect, the breast advanced (Fig. 2); on approaching the second ring extend the right hand and

Fig 1.

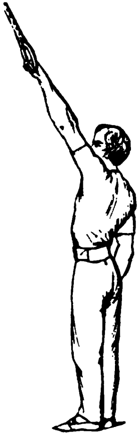
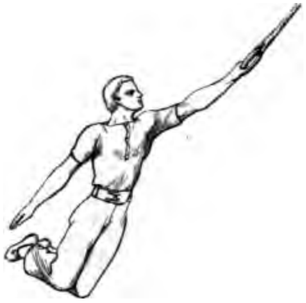
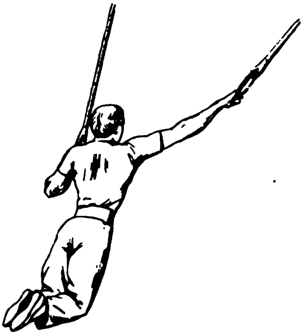


Fig. 2.



grasp it, and, while retaining it lightly in the hand, return to the farthest point of the backward oscillation on the ring grasped by the left (Fig. 3); at this point quit the grasp of the left, withdrawing the hand lightly and leaving the ring motionless, turn to the right and bring the left hand in a full sweep round by the thigh, the arm quite straight and fingers pointed downwards, describing a half circle in the sweep, extend it to the front, and grasp the next ring. Repeat. On grasping the last ring turn quickly round, facing the row, and descend yielding.

Fig. 3.

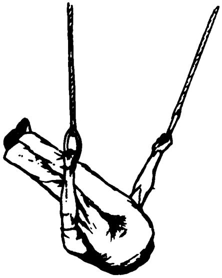


The circle in the swing.

EXERCISE 2.
COURSE IV.

1. Grasp the first ring with the left hand and proceed to the grasp of the second with the right hand as described in the previous exercise. During the return oscillation elevate the lower limbs straight and together to the front, and turning the body to the left pass them above the left arm, quitting the grasp of the left hand as the legs touch the arm (Fig. 4). Allow the legs to descend to the original position during the forward swing, bringing the left arm down by the thigh, and grasp the next ring. Again bring the legs up during the return oscillation, and turning the body to the right pass the legs over the right arm. Repeat.

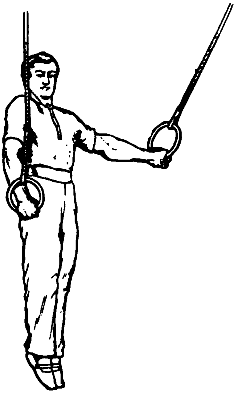
Fig. 4.



To rise above the rings in the swing.

EXERCISE 3. COURSE IV. 1. Proceed as usual to the grasp of the second ring, and immediately pressing it inwards by the right side, rise above it, and as the body returns during the backward swing rise above the ring with the left arm also, bringing the body to the position of the Rest above the rings facing left. As the oscillation becomes completed, extend the left arm, allowing the body slowly to descend beneath the rings, quit the grasp of the left hand, and take the next ring; rise above on the left arm in similar position, facing right, and repeat.

Fig. 5.



APPENDIX TO THE ROW OF RINGS.

To stand above the rings alternately in the swing.

EXERCISE 4. 1. Proceed as before to the grasp of the second ring, and on the return oscillation bring the feet quickly up above the head and crossing them pass the insteps round the rope of the second ring. Quit the grasp of the first ring, pass to the third, and on the return oscillation quickly let the lower limbs descend to the front and re-elevate them by the other side, again passing the insteps round the rope of the further ring. Repeat.

THE ELASTIC LADDER.

THE exercises on this machine resemble in character that on the Row of Rings, and have the same object, i. e. the equalization of the arms and upper part of the body; they are two in number, the second being but a more advanced and dexterous mode of performing the first. They are several degrees more difficult than that on the row of rings, the machine being firm, and the whole weight of the descent in the oscillation coming upon the sustaining hand. They are, however, always favourites, and when the ladder is well arranged and perfectly secure in its vertical straps and horizontal fastenings, and a class of men pass along it, each taking the spar as it is relinquished by his predecessor, there is no more effective exercise in the gymnasium.

Short distances, consisting of a few spars only, should be attempted at first, and with beginners only one should be passed along the ladder at a time, the instructor walking by his side, giving directions and explanations as each step is made.

The elastic ladder should be suspended at a height of 8 feet 6 inches from the floor; the width of the ladder should be 15 inches, the spars 9 inches apart. It may be of any length beyond 30 feet.

Single Series.

Position of attention under the ladder, facing the standard.

The single step.

EXERCISE I.
COURSE II.

1. Ascend to the step and with the right hand grasp the first spar, the fingers and thumb meeting, face to the left, lean forward, fully extend the left arm and grasp the spar nearest the hand, the palm facing the range of the ladder (Fig. 1).

2. Lift both feet from the step, and in their fall let them swing as far as the advanced hand, the head erect, the legs straight and together, the toes pointed to the ground; on the return oscillation towards the right, quit the grasp with the right hand, and bring it in full sweep (the arm quite straight) round by the thigh (the body turning at the same time), extend it to the front and grasp the nearest spar (Fig. 2); again let the trunk and lower limbs fall

Fig. 1.

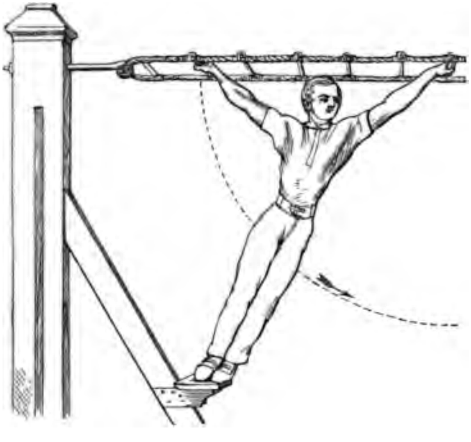
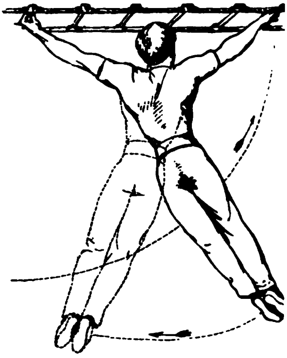


Fig. 2.



to the rear until they are under the left hand (as shown by dotted lines on Fig. 2), quit the grasp with the left hand, pass it round by the thigh (the body turning), and complete the movements of the step. Repeat.

At the completion of the last step, steady the body, bring it to the vertical position, quit the grasp with both hands, and descend yielding.

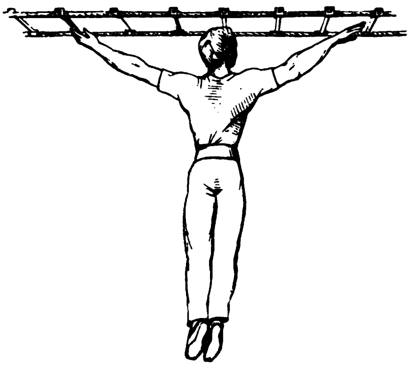
The double step.

EXERCISE 2.
COURSE IV.

1. Grasp the spars as described in the previous exercise.

2. As in the preceding exercise to the forward oscillation, but instead of retaining the grasp of the left hand while the right passes to another spar, quit the grasp of the left (Fig. 3), thus allowing the forward oscillation to enable the right hand to grasp a spar in advance of that which it could have grasped had the left retained its hold; the exercise thus consisting of a succession of leaps, without pause, only one hand ever being on the ladder at one time, and towards the terminating movement of each step, both hands being free (Fig. 3). Repeat.

Fig. 3.



On grasping the last spar, sweep the disengaged hand rapidly round by the thigh, make a complete turn with the body, quit the grasp and descend yielding.

THE HORIZONTAL BAR.

THIS machine, in the variety of its exercises and their importance, is second to none in the gymnasium, and influences alike upper limbs and trunk and lower limbs in a marked degree. It is important that every gymnasium should contain two forms of horizontal bar, the short ash bar with a steel core, and the long iron bar; the former will be employed in all exercises where pliancy is required, such as in circling and swinging movements, whilst the latter will be reserved for exercises where steadiness is desired, as for travelling. The first of these two is the one which is generally known as the Horizontal Bar, and to it belongs far the greater variety of exercises.

These exercises conveniently divide themselves into three series, the first consisting of all exercises *below* the bar, the second, of those *rising up to and above* the bar, the third, of *circling round* the bar; but the exercises of all three series are more generally used in combination. A large number of the circles round the bar, which seem the most effective to the spectator, are the least beneficial to the performer, and cause undue strain on a single part; the accomplished gymnast will perform these with a dexterity which mitigates the strain, and admits of their performance without harm, though without real benefit (other than variety). These exercises therefore find no place in the System itself, but are fully described in the Appendix to the machine.

Several of the exercises resemble in nature and purpose certain exercises of the Trapezium; and where these are not described, a short list of those which are identical on the two machines is appended. In consequence of the additional height from the ground, the instructor will be unable to render such material assistance as in the case of the Trapezium. He will stand to the right or left, facing the learner.

The horizontal bar should be 7 or 7½ feet long, having a diameter of about 1½ inches, formed of ash with a steel core. This is the most practical form, though many continental gymnasts prefer a steel bar covered with leather. The bar is fixed to two iron uprights, which are sustained by stays running from the top of the uprights to the ground, and so constructed that the machine may be removed if desired. The bar can be raised to the required height from the ground.

FIRST SERIES . . .	*Below the bar.*
SECOND SERIES . .	*Rising to and above the bar.*
THIRD SERIES . . .	*Circling round the bar.*

First Series.

Position of attention facing the bar.

The principal exercises of the first series have already been described under the Trapezium and Pair of Rings. They are:—

The single circle under the bar.

EXERCISE 1. COURSE I. (Cf. Figs. 1, 2, 3, p. 229.)

The double circle under the bar.

EXERCISE 2. COURSE II. (Cf. Figs. 1, 2, 3, p. 229.)

To turn under the bar on one hand.

EXERCISE 3. COURSE IV. (Cf. Figs. 17, 18, p. 221.)

To form the straight line backwards.

EXERCISE 4. COURSE IV. (Cf. Fig. 19, p. 221.)

VARIATION. COURSE IV. It is possible to throw the weight of the body as much as possible on to one arm, and remove the grasp of the other hand, supporting the body in the straight line upon one arm alone. This adds enormously to the difficulty of the exercise and is rarely performed.

To form the straight line forwards.

EXERCISE 5. COURSE IV. (Cf. Fig. 10, p. 232.)

To form the straight line sideways on one arm.

EXERCISE 6. COURSE IV. (Cf. Fig. 11, p. 233.)

To swing to the front.

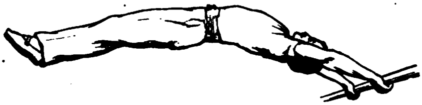
The lay out.

EXERCISE 7. COURSE III. 1. Spring forward and grasp the bar, fingers and thumbs together, and as the lower limbs pass beneath the bar, rapidly bend the arms and elevate the lower limbs till the chest is as high as the bar. At this point force the lower limbs to the front, rapidly curving the back inwards, and allowing the arms to come to their full extension (Fig. 1), keeping a firm hold of the bar. The whole body will now swing with great impetus to the rear, sufficient to carry it above the bar, in position for further exercises, when these have been acquired.

Until this has been done, the descent should be made at the end of the swing to the rear, quitting the grasp of the hands, and so coming yieldingly to the ground.

This exercise is in reality a preliminary movement to some of the exercises of the second and third series, which demand a greater impetus than can be gained by mere oscillations beneath the bar with the legs suspended in the usual position.

Fig. 1.



Second Series.

Position of attention facing the bar.

To rise to the bar.

EXERCISE 8.
COURSE I.

1. Spring from the ground and grasp the bar, the hands at the distance, the fingers and thumbs meeting, the arms straight, the trunk of the body upright, the legs straight and together, the feet together, the toes pointed to the ground (Fig. 2).

2. Bend the arms, raising the body until the chin rises above the bar (Fig. 3), sink again to the full

Fig. 2.

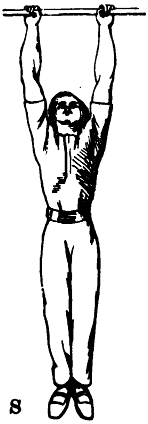
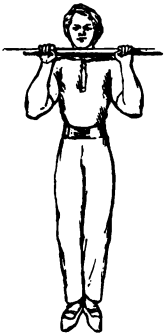


Fig. 3.



extension of the arms, quit the grasp, and descend yielding.

This exercise to be repeated with the lower limbs extended horizontally to the front, and also with the grasp of the hands reversed.

This exercise should be carried into the second, third, and fourth courses by rising to the bar three, six, nine, twelve or more times consecutively and without pause, according to the capacity of the learner.

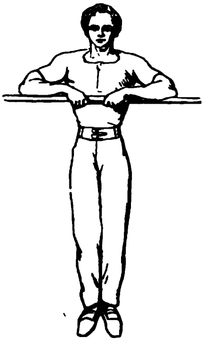
To rise above the bar by the forearm, right and left.

EXERCISE 9.
COURSE II.

1. Spring from the ground and grasp the bar as in the previous exercise, the fingers and thumbs meeting.

2. Bend the arms until the chin rises above the bar, raise the right elbow and extend the forearm along the surface of the bar, the left following (Fig. 4), press strongly with the hands, straighten the right arm to its full extension, the left following, and remain sustained by the hands, in the vertical line, above the bar.

Fig. 4.



In descending, let the left forearm return to the bar, the right following, pass the left beneath the bar, the right following, quit the grasp, and descend yielding.

To rise above the bar by the forearm, both hands at once.

EXERCISE 10.
COURSE II.

1. Grasp the bar as previously, the fingers and thumbs meeting.

2. Bend the arms as in preceding exercise, raise both elbows and extend the forearms along the

surface of the bar, press strongly with the hands, straighten both arms to their full extension, and rise above the bar as in preceding exercise.

In descending, let both forearms slowly return to the bar, pass both arms beneath the bar, quit the grasp, and descend yielding.

To rise above the bar, the right leg acting.

EXERCISE II.
COURSE II.

1. Spring from the ground and grasp the bar with both hands, right and left of the bar, the left in advance, the fingers and thumbs meeting.

2. Bend the arms, lift the lower limbs, separating the feet as they rise, pass the left leg over the bar, resting on it under the knee, pass the right leg over the left, the calf of the right overlying the instep of the left, the head held back, the trunk sustained.

Fig. 5.

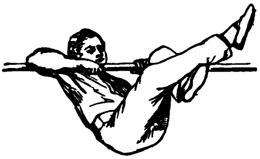
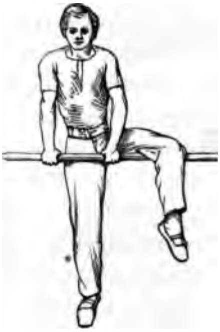


Fig. 6.



3. Quit the grasp of the right hand, pass it under the bar to the opposite side next the body and grasp the bar, elevate the elbow and rest the forearm along the bar (Fig. 5); detach the right leg from the left, straighten it, and rapidly

pass it under the bar with a momentum sufficient to enable the body to rise above it, press strongly with both hands, extend the arms, advance the left leg, and let it rest above the bar (Fig. 6).

In descending, re-bend the right arm, draw back the left leg, lower the body, and place the right leg over the left as in the ascent; sustain the body, detach the legs from the bar, straighten the arms, and descend yielding.

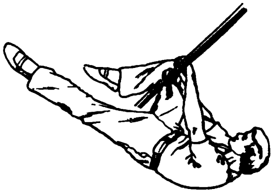
This exercise to be repeated, the left leg acting, the right hand in advance, the right leg resting on the bar.

To rise above the bar in the swing, the left leg acting.

EXERCISE 12. COURSE III. 1. Standing a pace or two from the bar, spring from the ground and grasp the bar as previously, the fingers and thumbs meeting.

2. Let the lower limbs swing well to the front in position, and on the return oscillation pass the right leg over the bar outside the hands, resting on it under the knee (Fig. 7). Without pause bend the arms, press firmly and quickly down upon the hands and rise above the bar. Pass the right leg over the bar to the position of the left, and remain in the vertical position resting on the hands—the Rest above the bar.

Fig. 7.



In descending, slowly re-bend the arms, sink beneath the bar, quit the grasp, and drop yieldingly to the ground.

The same exercise to be repeated, the right leg acting, and passing the left leg over the bar.

VARIATIONS.
COURSE IV.

The exercise may be varied by passing the leg between the hands, in which case the method is the same, except that after rising above the bar, the grasp of the left or right hand respectively must be relinquished, in order to pass the leg over the bar to the vertical position of the Rest.

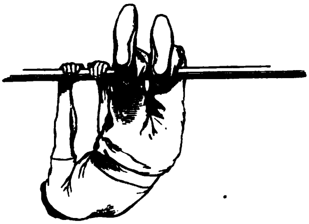
To rise above the bar in the swing, both legs at once.

EXERCISE 13.
COURSE IV.

1. Spring from the ground and grasp the bar as in the preceding exercise, except that the hands are placed nearly together, the fingers and thumbs meeting.

2. Let the lower limbs swing well to the front, and on the return oscillation pass both legs quickly over the bar to the left of the left arm, resting on the bar under the knees (Fig. 8); without pause bend the arms, press firmly down on the bar, and rise above it to the sitting position on the bar, the legs outside the hands.

Fig. 8.



To descend, press strongly away from the bar with the hands, straighten the legs, and descend yielding to the ground.

This exercise to be repeated with both legs outside the right arm.

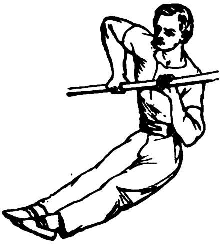
VARIATIONS.
COURSE IV.

The above exercise may be varied by placing one leg between the hands and the other outside either the left or right arm; or by placing both legs inside the hands, grasping the bar with the hands at the distance.

To rise above the bar, right and left.

EXERCISE 14. COURSE III. 1. Grasp the bar as previously, the fingers and thumbs meeting.

Fig. 9.



2. Bend the arms until the chin rises above the bar, and raise the right elbow vertically above the bar (Fig. 9), the left following, straighten both arms to their full extension, and rise above the bar in the vertical line, as in preceding exercise.

In descending, re-bend the left arm, the right following, let the left sink below the bar, the right following, straighten the arms, and descend yielding.

This exercise to be repeated with the left hand leading.

To rise above the bar, both hands at once.

Fig. 10.

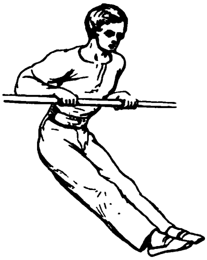
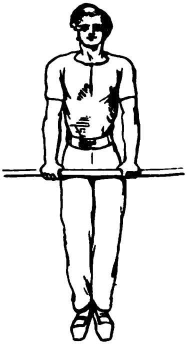


Fig. 11.



EXERCISE 15. COURSE IV. 1. Grasp the bar as previously, the fingers and thumbs meeting.

2. Bend the arms until the chin rises above the bar, and without pause press strongly upon the bar with both hands at once, continue the upward movement and rise above it (Fig. 10), immediately completing the extension of the arms, and sustain th

body on the hands in the vertical line above the bar (Fig. 11). This series of movements to be executed without pause and at the same pace throughout.

In descending, slowly re-bend the arms, sink beneath the bar, quit the grasp, and descend yielding.

To rise above the bar backwards, right and left.

EXERCISE 16.
COURSE IV.

1. Grasp the bar as previously, except that the grasp of the right hand is reversed, the fingers and thumbs meeting.

2. Raise the lower limbs by the front in position until the feet are as high as the bar, pass the feet under the bar between the hands, straighten the lower limbs and let them descend by the rear (Fig. 12), elevate the right side of the body, bringing it close up by the bar, and pressing strongly with the right hand until the forearm is straight above the bar, slackening but not quitting the grasp of the left hand (Fig. 13), support the weight of the body entirely on the right arm, quit the grasp of the left hand, and re-grasp the

Fig. 12.

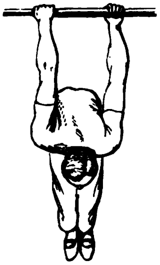


Fig. 13.

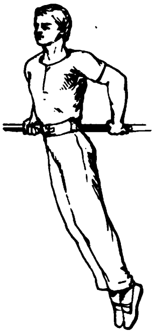
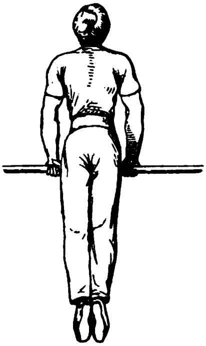


Fig. 14.



bar at the distance beyond the right, at the same time turning the breast fully round to the bar, and resting equally on both hands (Fig. 14).

In descending, reverse the movements of the ascent, or descend as usual from the Rest.

This exercise to be repeated, left and right.

To rise above the bar backwards, both hands at once.

EXERCISE 17.
COURSE IV.

1. Spring up and grasp the bar as previously, except that the grasp of both hands is reversed, the fingers and thumbs meeting.

2. Proceed as in the previous exercise to the elevation of the right forearm above the bar; from this point, instead of quitting the grasp of the left hand, elevate the left side and raise the forearm above the bar, press strongly from both hands, and rise seated on the bar.

In descending, reverse the movements of the ascent.

To rise above the bar, both hands at once.

A Second Method.

The upstart.

EXERCISE 18.
COURSE IV.

1. Standing a pace or two away spring forward and catch the bar, the fingers and thumbs together.

2. Let the lower limbs swing well to the front, and at the completion of the swing quickly raise the lower limbs in position (Fig. 15) until the insteps touch the bar. Pass the *feet outwards* and downwards, at the same time pressing *strongly* downwards with the hands and keeping the bar

close to the body, and as the lower limbs return to the rear, pressing firmly on the hands and wrists (Fig. 16), rise above the bar, immediately completing the extension of the arms, and sustaining the body on the hands in the vertical line above the bar. Thence descend as usual.

Fig. 15.

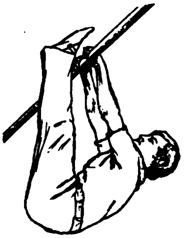
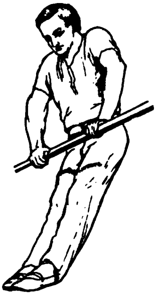
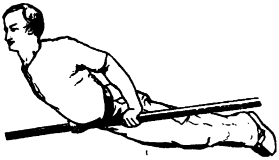


Fig. 16



The exercise, as described above, ends with the vertical Rest above the bar; but as the upstart (like the succeeding exercise, the uprise) is usually performed with a hollow back and as a preliminary to other exercises, it is necessary to bring the body to a hollow-back Rest, with the trunk upon the bar supporting the body, the lower limbs extended in position to the rear (Fig. 17). The upstart and the uprise (Ex. 19) being the usual methods of rising above the bar previously to circling and like exercises, the term Rest, as applied to the horizontal bar, generally denotes this position.

Fig. 17.



VARIATIONS. COURSE IV. Varied forms of the upstart are:—1. The upstart with hands reversed. 2. The upstart without a swing.

To rise above the bars in the swing, both hands at once.

By the uprise.

EXERCISE 19.
COURSE IV.

1. Spring forward and grasp the bar, the fingers and thumbs together, and proceed with 'the lay out' as described in Exercise 7 (Fig. 1).

2. The whole body will now come rapidly to the rear, and as the end of the backward oscillation is reached, pull strongly from the hands and wrists and rise up above the bar (Fig. 19), and thence come to the Rest above it (Fig. 17) with the trunk on the bar.

Fig. 18.

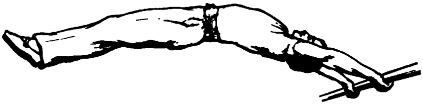
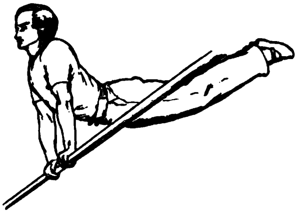


Fig. 19.



This is the complete exercise, but, in consequence of the impetus gained in the rise, great control is required in order to reach the Rest, and it is therefore far more usually employed in combinations, the performer proceeding without pause from the position shown in the figure to one of the vaults over the bar or to the short circle, &c.

To swing to the front from the rest above the bar.

The 'lay out' from the Rest.

EXERCISE 20.
COURSE III.

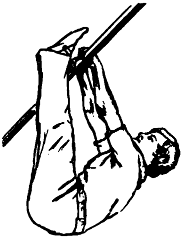
1. Incline the body backwards, keeping the arms at full extension, and as the lower limbs pass under the bar, elevate them till the insteps rise above the bar; thence rapidly hollow the back, and forcing the lower limbs to the front, as described in the swing to the front from the ground (Ex. 7), complete the lay out.

To 'drop back' from the rest above the bar.

EXERCISE 21.
COURSE IV.

1. Incline the body backwards, retaining the arms at full extension, and descend beneath the bar; as the arms come to a position horizontal with the bar, immediately elevate the lower limbs till the insteps reach the bar (Fig. 20), retaining them in position.

Fig. 20.



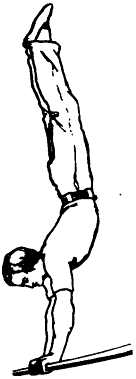
To 'throw out' from the rest above the bar.

EXERCISE 22.
COURSE IV.

1. Incline the head and shoulders forward and at the same time pass the lower limbs slightly to the front beneath the bar, so that the lower part of the trunk rests upon it. Without

pause press strongly from the lower part of the trunk, and retaining the arms at full extension, throw the lower limbs to the rear till they pass almost to the vertical position (Fig. 21). Thence the descent beneath the bar is commenced with great impetus.

Fig. 21.



The three foregoing exercises, 20, 21, 22, are in reality merely preliminaries to the repetition of previous ones or to their combination with others, when renewed impetus is required, and it is thus necessary to swing once more beneath the bar to obtain it. The exercises should however be first practised separately in this place.

To shoot to the front from the rest above the bar.

EXERCISE 23.
COURSE III.

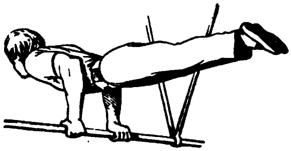
1. Incline the body backwards, the arms at full extension, and elevate the lower limbs to the front till the insteps are in line with the bar (Fig. 20); immediately hollow the back, force the lower limbs to the front as in the 'lay out,' pulling strongly with the hands, quit the grasp, and descend yielding some distance to the front of the bar.

This exercise is merely a convenient method of varying the descent from the Rest above the bar.

To form the straight line above the bar.

EXERCISE 24. COURSE IV.

Fig. 22.



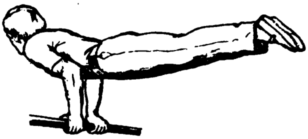
This exercise, together with the three succeeding ones, 25, 26, 27, already described under the parallel bars, admits also of being performed on the single bar. They all commence from the position of the

Rest, which must be reached by one of the methods previously described in this series; thence the head and shoulders are inclined to the front and the lower limbs elevated by the rear, according to the methods previously described under the parallel bars.

To form the straight line above the bar, resting on the elbows.

EXERCISE 25. COURSE IV.

Fig. 23.



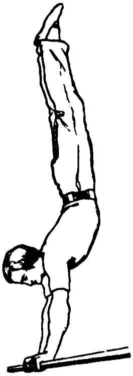
The short-arm balance.

EXERCISE 26. COURSE IV.

The straight-arm balance.

EXERCISE 27. COURSE IV.

Fig. 24.

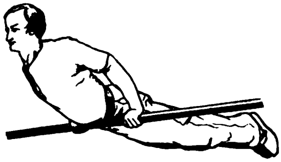


The front vault over the bar in two movements.

EXERCISE 28. COURSE III. 1. Complete the upstart to the Rest (Fig. 25).

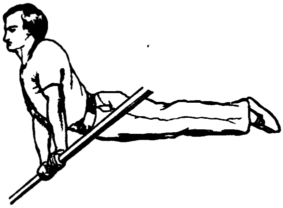
2. Slightly bend the arms and allow the lower limbs to pass to the front underneath the bar; let them again swing to the rear, press strongly from the lower part of the trunk and clear the bar, descending yielding, the face to the bar.

Fig. 25.



The front vault over the bar.

Fig. 26.



EXERCISE 29. COURSE IV. 1. Complete the upstart, and as soon as the body rises to the position of the Rest, without pause slip the thumb round the bar, press strongly on the hands and wrists (Fig. 26) and clear the bar, descending yieldingly facing the bar.

Third Series.

Position of attention facing the bar.

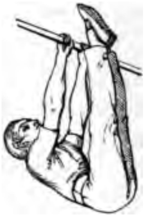
To turn round the bar.

EXERCISE 30.
COURSE III.

1. Spring to the bar and grasp it as previously, the fingers and thumbs meeting.

2. Lift the lower limbs in position to the front until the feet are as high as the bar, retaining the arms straight (Fig. 27), bend the arms, carry the feet and lower limbs over the bar, letting the upper part of the body pass under and up the side of the bar and over its surface, while the lower part ascends, passes its surface and descends to the rear, until the whole body has cleared the bar, and rests in a perfectly vertical line on the hands above the bar, the arms extended.

Fig. 27.



In descending, set the body free from the bar, straighten the arms, and descend yielding.

To turn round the bar, the hands reversed.

EXERCISE 31.
COURSE III.

1. Spring to the bar and grasp it as previously, except that the hands are reversed.

2. As in preceding exercise, retaining the reversed grasp of the hands.

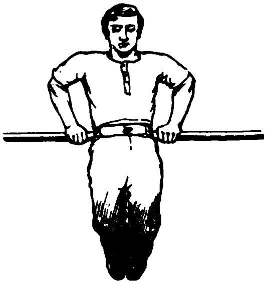
In descending, bring the elbows close in by the sides, tighten the grasp of the hands, slowly incline the head and shoulders to the front, elevate the lower limbs to the rear, allowing the body to rest on the trunk; return over the bar, passing the body again under it, the lower limbs being in contact with the bar, as they pass, from the thighs to the toes, bring the lower limbs to the vertical line, and descend yielding.

To turn round the bar backwards.

EXERCISE 32. COURSE III. 1. Grasp the bar as before, the fingers and thumbs meeting.

2. Lift the lower limbs in position to the front until the feet are as high as the bar, retaining the arms straight, as in Fig. 27. Pass the feet under the bar between the hands, and by a continuous movement bend the back inwards and extend the lower limbs upwards, bending the arms until the waist is as high as the bar; let the lower half of the body slowly fall to the front, and as it descends let the upper half ascend in position; sink slowly down, the back touching the bar, to the Bent-Arm Rest backwards (Fig. 28).

Fig. 28.



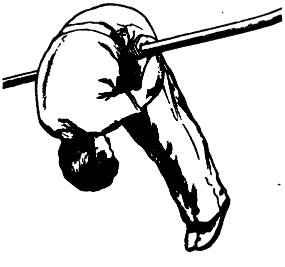
In descending, press upon the hands and rise to the seat upon the bar. Allow the body to fall backwards, grasping the bar with the hocks. Pass the feet under the bar between the hands and slowly lower them to the front.

The front roll over the bar.

EXERCISE 33. COURSE IV. 1. Come to the position of the Rest upon the bar.

2. Incline the head and shoulders forward and let the lower part of the trunk fall on the bar, shifting the grasp of the hands to the top of the

Fig. 29.



bar (Fig. 29). As the lower limbs pass over the top of the bar, press strongly downwards on the hands, and as the lower limbs fall to the front, rise once more above the bar and come to the position of the Rest. Descend as usual.

To encircle the bar forwards from the rest.

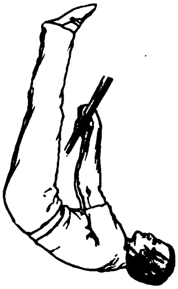
Short circle.

EXERCISE 34.
COURSE IV.

1. Rise by one of the methods of the first series to the Rest above the bar, the fingers and thumbs together.

2. Allow the lower limbs to come slightly to the front, and on their return press strongly away from the bar with the lower part of the trunk and throw the lower limbs to the rear, retaining the arms straight. Now pull strongly from the hands, and keeping the back so far as possible in its curved position, allow the lower limbs to fall downwards under the bar, and again rise upwards and over it (Fig. 30) to the original position of the Rest, being careful to maintain the arms straight throughout the exercise. Descend by the usual method.

Fig. 30.



To encircle the bar from the ground.

Clear circle.

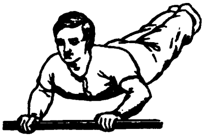
EXERCISE 35.
COURSE IV.

1. Spring forward one or two paces and grasp the bar with both hands, the fingers and thumbs together.

2. Bend the arms sharply and instantly shoot the lower

limbs and the whole column of the body up over the bar. and as they rise above it quickly curve the back inwards, continuing the circle up to and over the bar (Fig. 31), lowering the body by the rear; quit the grasp, and drop yielding to the ground.

Fig. 31.



In the case of repetitions or of combinations with other exercises, it is necessary on rising above the bar to shift the hands with a rapid movement to the top of the bar.

To encircle the bar, the arms straight, from the rest above the bar.

The grand circle.

EXERCISE 36.
COURSE IV.

1. Come to the Rest above the bar, the fingers and thumbs together.

2. Throw out backwards, as previously directed, with great impetus, being careful to retain the arms and the whole trunk straight and stiff, to the position of Fig. 32, and thence let the lower limbs swing downwards under the bar and upwards beyond. As the body rises to

Fig. 33.

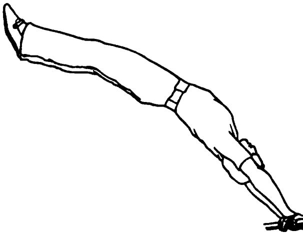
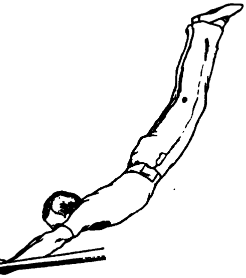


Fig. 32.



a level with the bar hold the head well back, and a little further when in the angle represented in Fig. 33, instantly shift the hands to the top of the bar and complete the circle, the arms at full extension throughout.

The perfect circle will naturally lead to the Rest, and thence to a descent as usual; but the position obtained of the straight-arm balance at the top of the bar more naturally leads to other exercises, or to a different finish, or a repetition.

To encircle the bar, the arms straight, from the rest above the bar, the hands reversed.

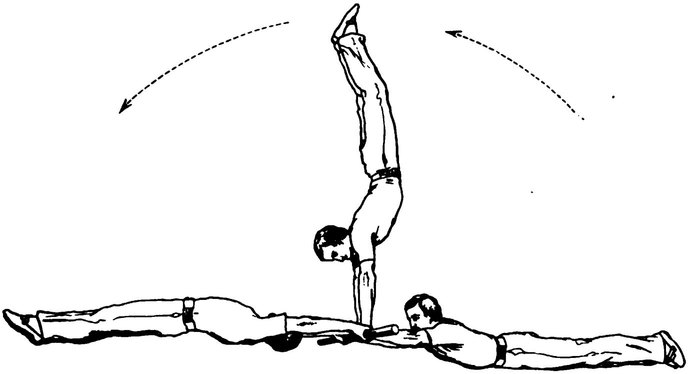
The grand circle backwards.

EXERCISE 37.
COURSE IV.

1. Come to the Rest above the bar by the upstart, the hands reversed, the fingers and thumbs *meeting.*

2. 'Throw out' backwards with all the impetus possible, keeping the arms and the whole trunk straight and stiff, and let the body momentarily reach the position of the straight-arm balance (Fig. 34), and thence sweep over the bar and

Fig. 35. Fig. 34. Fig. 36.



downwards; as the body falls over the bar elevate the head well forward between the hands, the arms and body alike maintaining their extended position (Fig. 35). As the body again rises on the other side of the bar, quickly shift the hands, as described in the previous exercise (Fig. 36).

In order to complete the perfect exercise it is necessary, as the body again reaches the position of the straight-arm balance, to bend the arms and let the lower part of the trunk descend to and rest on the bar, so coming to the position of the Rest. But the exercise, like the previous one, more naturally leads to others or to repetitions.

APPENDIX TO THE HORIZONTAL BAR.

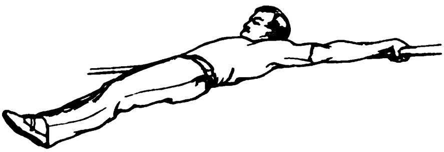
Second Series.

The uprise from the reverse swing.

EXERCISE 38. 1. Rise to the Back-Rest on the bar by the ordinary back circle, and thence to the seat on the bar.

2. Rapidly reverse the grasp of the hands, and without pause press strongly from them and shoot the body to the front with impetus, straightening the arms (Fig. 37). Thence let them descend to the rear and under the bar with full force, and pulling strongly from the hands, let the body rise above the bar in position as in the uprise, except that so soon as the trunk has risen above the bar the grasp is relinquished and the bar retaken with the ordinary grasp.

Fig. 37.



This exercise is somewhat similar to the reversal movements on the rings.

The vault over the bar between the hands.

EXERCISE 39. 1. Complete the uprise in the swing, and without coming to the Rest pull strongly from the hands, bring the legs up over the bar between the hands, and by a quick push of the hands away from it pass the body over the bar and descend yieldingly to the ground on the further side.

This exercise, like the front vault over the bar, is best practised in two movements, coming to the Rest with the trunk on the bar by means of the upstart, and thence clearing the bar in position by strong pressure on the hands and wrists.

To vault over the bar, the legs astride.

EXERCISE 40. 1. Rise above the bar by the uprise in the swing, and without coming to the Rest pull strongly with the hands, quickly round the back, and, bringing the legs up over the bar outside the hands, pass the body in position over the bar, descending quickly upon the further side.

This exercise, like the foregoing one, is best practised in two movements, coming to the Rest with the trunk on the bar by means of the upstart.

Third Series.

To encircle the bar backwards from the ground.

The back shoot.

EXERCISE 41. 1. Spring to the bar, standing a pace or two away, and let the lower limbs swing well to the front. Quickly elevate them and pass the feet through the hands. Instantly straighten the lower limbs again (Fig. 38), and at the same time pull strongly with the hands and once more round the back.

This will bring the body over the bar to the momentary sitting position, resting on the hands (Fig. 39); without pause push away from the bar with the hands, and shooting the body forwards, drop yielding to the ground, the hands at the sides.

Fig. 38.

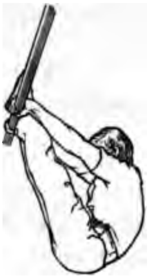
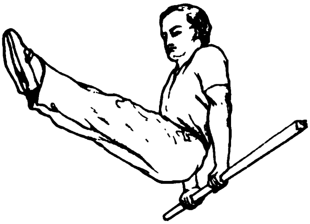


Fig. 39.



The above exercise may be performed retaining the back hollow throughout, but in this case it is considerably more arduous.

To encircle the bar by the hands backwards.

The hand grind.

EXERCISE 42. 1. Turn over the bar backwards by the ordinary method (Exercise 32) to the position of Fig. 40, the small of the back resting on the bar, the back curved

Fig. 40.

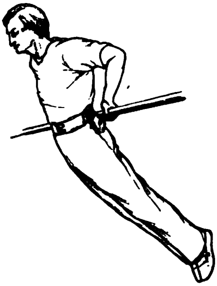
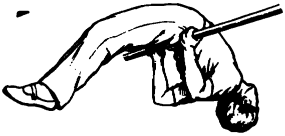


Fig. 41.



inwards, reversing the grasp of the hands as the lower limbs fall over the bar.

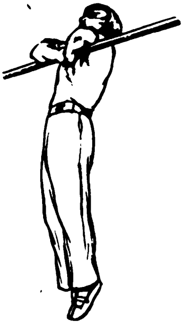
2. In the complete exercise the above position is only momentary. Swing the lower limbs in position to the rear, upwards, and over the bar (Fig. 41), completing the circle.

To encircle the bar by the forearm.

EXERCISE 43. 1. Rise to the Rest upon the bar, the hands close together, the fingers and thumbs meeting.

2. Bend the arms and let the forearms drop upon the bar (Fig. 42). Let the lower limbs swing to the rear, and on the return oscillation let them rise upwards, in position, and over the bar, returning to the Rest upon the forearms.

Fig. 42.



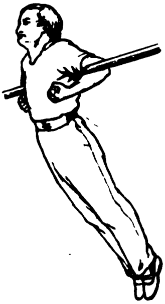
To encircle the bar by the upper arm backwards.

The muscle grind.

EXERCISE 44. 1. Turn over the bar backwards by the ordinary method (Exercise 32).

2. As the lower limbs fall over the bar, quit the grasp of both hands and drop on to the arms at the elbows in the position of Fig. 43. Elevate the lower limbs to the front, and on the return oscillation, let them pass upwards and over the bar, completing the circle.

Fig. 43.



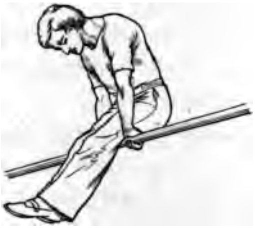
To encircle the bar by the hocks.

The sitswing.

EXERCISE 45. 1. Turn over the bar backwards by the ordinary method to the Bent-Arm Rest backwards.

2. Instead of relinquishing the grasp, press from the hands, straighten the arms, and rise to the seat on the bar. Reverse the grasp of the hands, straighten the arms and let the hocks rest on the bar (Fig. 44). Let the head and shoulders fall forward, grasping the bar with the hocks, and so pass beneath the bar and up to the original position, completing the circle.

Fig. 44.



In this and all other circles involving the grasp of the two hands, it will be found necessary, where it is desired to repeat the exercise, to shift the hands rapidly to the top of the bar as the body rises to complete the circle after passing under the bar.

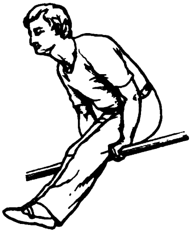
To encircle the bar by the hocks backwards.

The sitswing backwards.

EXERCISE 46. 1. Turn over the bar backwards by the ordinary method to the Bent-Arm Rest backwards.

2. Rise to the seat on the bar as in the previous exercise, retaining the ordinary grasp of the hands. Let the body fall backwards in position, the

Fig. 45



hocks grasping the bar (Fig. 45), under the bar and again above it to the original position, completing the circle.

In early exercises shift the hands.

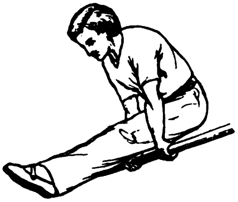
VARIATIONS. Exercises 44 and 45 may be repeated with the legs outside the hands, and also with one inside and one outside; or the arms may be passed under the bar and clasp the knees.

To encircle the bar by the hands, the legs up.

The free sitswing.

EXERCISE 47. 1. Come to the Bent-Arm Rest backwards, and thence to the seat on the bar by the ordinary back circle.

Fig. 46.



2. Reverse the grasp of the hands, press strongly upon them till the body is raised above the bar, supported solely by the arms, the feet and legs elevated straight and together to the front (Fig. 46). In this position let the head and shoulders fall forward, underneath the bar and up on the further side, completing the circle.

To encircle the bar by the hands, the legs up, backwards.

The free sitswing backwards.

EXERCISE 48. 1. Come to the Bent-Arm Rest backwards and thence to the seat on the bar by the ordinary back circle.

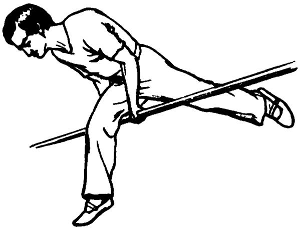
2. Without changing the grasp of the hands, elevate the lower limbs, straighten the arms till the body is supported upon them alone as in the previous exercise, and let the body fall backwards under the bar; as it rises once more on the further side pull strongly from the hands, and rise above the bar, completing the circle.

To encircle the bar by one hock.

EXERCISE 49. 1. Rise above the bar, one leg acting.

2. Reverse the grasp of the hands, extend the acting leg to the rear, grasping the bar with the hock of the other (Fig. 47); incline the head and shoulders forward, and letting the body pass under the bar, and pulling strongly from the hands, rise again to the original position, completing the circle.

Fig. 47.



To encircle the bar by one hock backwards.

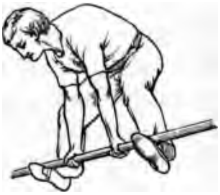
EXERCISE 50. 1. Rise above the bar, one leg acting.

2. Retaining the ordinary grasp, extend the acting leg to the rear, and inclining the trunk of the body to the rear, let it swing downwards, under the bar, and rise again to the original position, completing the circle.

To encircle the bar by the insteps.

EXERCISE 51. 1. Rise above the bar by the upstart, with reverse grasp of the hands.

Fig. 48.



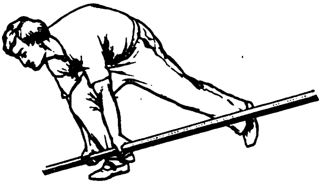
2. Without pause separate the legs to their full extension, and as the insteps come in contact with the bar (Fig. 48), incline the head and trunk forwards over the bar and complete the circle, quickly shifting the hands to the top of the bar as the body rises on the further side.

To encircle the bar by the single instep.

EXERCISE 52. 1. Rise above the bar by the upstart, with reverse grasp of the hands.

2. Without pause bring the instep of one leg up to the bar between the hands, extending the other leg fully to the rear (Fig. 49). Incline the head and trunk to the front and complete the circle as in the previous exercise.

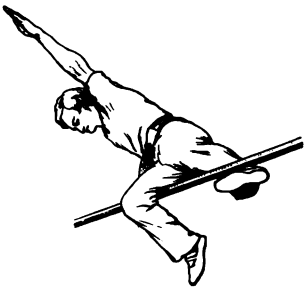
Fig. 49.



To encircle the bar by the hock and instep.

EXERCISE 53. 1. Rise above the bar with the left leg acting.

Fig. 50.



2. Reverse the grasp of the right hand, and extending the left arm above the head, place the left instep upon the bar with the leg at full extension (Fig. 50). Grasping the bar firmly with the right hand and the right hock, incline the head and trunk forwards and complete the circle.

The exercise to be repeated, the right leg acting.

To encircle the bar by the feet.

EXERCISE 54. 1. Rise above the bar by the upstart, with reverse grasp of the hands.

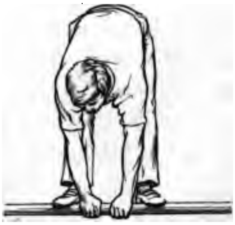
2. Without pause bring the feet outside the hands to the top of the bar, placing the *heels* upon the bar, retaining the arms and legs as straight as possible (cf. Fig. 51). Inclining the head and trunk forwards, let the body descend with impetus, and pass under the bar; in rising again on the other side of the bar, bend the knees and lean towards the bar, coming to the original position and completing the circle.

To encircle the bar by the feet backwards.

EXERCISE 55. 1. Rise above the bar by the upstart, ordinary grasp.

2. Bring the feet outside the hands to the top of the bars as in the previous exercise, placing the *ball of the foot* instead of the heels on the bar (Fig. 51). Retaining the arms and legs straight let the body fall to the rear, under the bar, and rise again above it; in rising again above the bar bend the knees and lean backwards, coming to the original position and completing the circle.

Fig. 51.



VARIATIONS. Exercises 54 and 55 may be performed with both hands outside the feet, or one inside and one outside.

To encircle the bar by the single foot.

The foot circle.

EXERCISE 56. 1. Rise to the bar by the upstart, with reverse grasp of hands.

2. Without pause bring the right (or left) foot up and on to the bar between the hands, placing the *heel* upon the bar and retaining the arm and leg as straight as possible. Extend the other leg to the rear, and inclining the head and trunk forward let the body descend with impetus, and as it rises on the opposite side of the bar, bend the knees and lean towards the bar, coming to the original position and completing the circle.

To encircle the bar by the single foot backwards.

The foot circle backwards.

EXERCISE 57. 1. Rise to the bar by the upstart with ordinary grasp of hands.

2. Without pause bring the right (or left) foot up and on to the bar between the hands, placing the *ball of the foot* upon the bar. Extend the other leg to the rear, and inclining the head and trunk to the rear complete the circle as previously described in the circle by the two feet.

To encircle the bar by the hocks alone.

Hock circle.

EXERCISE 58. 1. Rise to the bar by the ordinary circle backwards, and thence come to the seat on the bar resting on the hocks, as in the ordinary hock circle with grasp of hands (Exercise 46).

2. Without pause quit the grasp of both hands and extend the arms to the front between the legs (Fig. 52), and grasping the bar firmly with both hocks 'throw out' with great impetus to the rear, bringing the arms at full extension below the head; and in this position (Fig. 53) rise again above the bar, completing the circle.

Fig. 52.

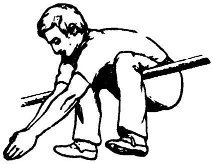
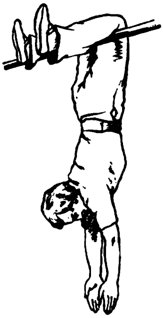


Fig. 53.

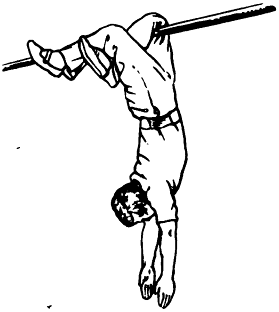


To encircle the bar by the single hock alone.

Single hock circle.

EXERCISE 59. 1. Rise above the bar, the left leg acting, the right leg between the hands. Pass the left leg to the front under the bar, and thence across the right leg, allowing the hock of the left leg to rest upon the instep of the right.

Fig. 54.



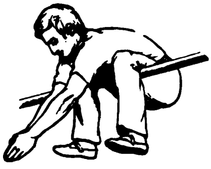
2. Without pause quit the grasp of the hands, and throwing out with impetus to the rear, let the body descend (Fig. 54) and rise again over the bar, completing the circle. In rising up on the other side of the bar, lift the body back as much as possible back to and over the bar.

To swing off from the hocks.

The hock swing off.

EXERCISE 60. 1. Rise above the bar by the back circle, and thence to the seat resting on the hocks.

Fig. 55.



2. Quit the grasp of the hands and bring the arms forward between the legs, extending both arms and knees outwards as far as possible, inclining the head and shoulders forward, and grasping the bar firmly with the hocks, the toes turned upwards (Fig. 55).

2. Quickly throw the hands above the head, and hollowing the back, throw the body to the rear; as it rises up on the other side of the bar, the hocks will loose their grasp; descend yielding to the ground, the arms extended above the head.

To swing off from the single hock.

The single hock swing off.

EXERCISE 61. 1. Rise above the bar, the right leg acting, and pass the right leg forward under the bar, and across the left, the right hock resting on the left instep. Quit the grasp.

2. 'Throw out' the body backwards with impetus as in the ordinary hock swing off, let it descend beneath the bar (cf. Fig. 54) and as it again rises on the opposite side of the bar, separate the feet, and, bringing the legs again together, descend yielding to the ground.

As a variation to the ordinary methods of descent, many finishes may be employed, as in the case of the trapezium and pair of rings. In addition to the Hock Swings Off may be enumerated:—

1. The *Drop from the Hock-Hang* at the end of the backward swing.
2. *Somersault from the Hocks,* sitting upon the bar.
3. The *Back Roll Off* from the position, lying extended across the bar.
4. The *Backaway* (see the Appendix to the Pair of Rings).
5. The *Forwardaway* (see the Appendix to the Pair of Rings).

Combinations of exercises.

The variety of combinations that may be formed on the horizontal bar is so great, that it would require a separate code book to describe them. They may be formed either by combining together the exercises given in the text in different order; or by varying the grasp in the different positions, e. g. in the swing, the hang, the balance, &c. &c.; or again by turning in the swing, the rest, the balance, &c. &c., and continuing the combination from the other side of the bar. The best methods of combining the various exercises will readily occur to the gymnast as he gains in proficiency:—it will suffice in this place to point out the more general lines on which the combinations of more difficult exercises should be formed by the pupil who has not yet become an accomplished gymnast. Almost all the exercises described in the Appendix are in reality combinations, the true method of rising above the bar previously to the performance of the special exercise being described in the text. The instructor will be careful to distinguish between slow exercises and rapid ones, and will impress upon the pupil the best method of leading up to the various combinations. Thus—

1. The rise above right and left (Ex. 14),
The rise above both hands at once (Ex. 15),
The rise above with one leg acting (Ex. 11, 12),
The rise above both legs at once (Ex. 13),
The ordinary backward circle (Ex. 32),

lead to the perpendicular Rest above the bar, and are naturally followed by such exercises as—

The straight lines above or below the bar.
The front roll.
The short circle.
Backward circles: sitswings.

2. The Upstart (Ex. 18) more naturally leads to the Rest with the trunk upon the bar, and will be followed by more rapid movements: e. g.
   - Upstart and shoot to the front.
   - Upstart and vault (right or left).
   - Upstart and back lift.
   - Upstart and vault between the hands.
   - Upstart and vault astride.
   - Upstart—straight-arm balance—spring from balance.

3. The Uprise (Ex. 19), on the other hand, does not naturally lead to the Rest, but is combined with other exercises without pause: e. g.
   - Uprise and vault (right or left).
   - Uprise and vault between the hands.
   - Uprise and vault astride.
   - Uprise—short circle—grand circle.
   - Uprise—feet circles, foot circles, instep circles, &c.

Slow exercises may of course be combined with more rapid ones: thus the slow rises and Upstart are best connected with the rapid movements which follow the swinging rise by means of—

(*a*) the 'lay out' to the front (Ex. 20),
(*b*) the 'throw out' to the rear (Ex. 22),
(*c*) the short circle (Ex. 34),

by means of which sufficient impetus is obtained to proceed with the combination: e. g.

Upstart—lay out—uprise and vault.
Upstart—throw out—grand circle.
Upstart—short circle—grand circle.

The instructor will be careful to require that exercises demanding great impetus and strong grasp, such as the swinging vaults and the grand circle, be only attempted by the most advanced pupils.

THE DOUBLE HORIZONTAL BAR.

By having two (or even three) horizontal bars set up parallel to one another, an apparatus may be formed somewhat similar to the moveable parallel bars, but affording exercises of one kind only, namely, of passing in different methods from the first to the second and third bar. A great number of these exercises are attended with considerable risk, and belong rather to the sphere of the acrobat, but the two given in the text are both useful and practical. It is also agreeable after performing exercises of the horizontal bar on one bar, to pass to the second and there continue. The two bars will be found very effective in displays, when two men may perform at the same time without danger The bars may be placed from 6 to 8 feet apart, according to the proficiency of the performer.

Single Series.

To pass from the first to the second bar.

Position facing the nearer bar.

EXERCISE I. COURSE III. 1. Grasp the nearer bar, elevate the lower limbs and let the body swing to the front, as described in the 'lay out' (p. 256), and then fully to the rear in position, the legs together, toes pointed downward, the back curved inwards, the arms straight.

On the return oscillation to the front elevate the legs slightly to the front, rapidly quit the grasp, and take the further bar, the arms slightly bent.

In order to return to the first bar, allow the body to swing again to the rear, and on the return front oscillation quit the grasp with both hands, rapidly change front and retake the bar; renew the oscillation, lay out, and spring again to the first bar.

To pass from the first to the second bar.

Changing Front.

Position with the rear to the further bar.

EXERCISE 2.
COURSE III.

1. Grasp the nearer bar and let the body swing to the front in position, as in the previous exercise (the 'lay out'). On the return oscillation to the rear, at the extreme end of the swing, quickly quit the grasp of both hands and, rapidly changing front, pass to the second bar, and take it with the arms slightly bent.

The above two exercises may be combined, by passing from the first to the second bar, continuing the oscillation, and on the return backward swing passing to the original bar, changing front.

THE IRON HORIZONTAL BAR.

THE iron horizontal bar is an essential to every gymnasium, affording, as it does, exercises which are very valuable for two reasons; first, from their own intrinsic value; second, from the circumstance that they are capable of being executed by an entire class at the same time, all obeying the same word of command. Obviously a vast number of exercises, similar to those on the short horizontal bar, may be performed on this machine, but from the nature of the machine and the lack of pliancy in the bar itself, the iron bar will only be resorted to for circling and such like exercises, when it is desired to have a number of men at work on the machine at the same time. The iron bar is therefore specially set aside for *travelling* exercises; and these resolve themselves into two series, travelling below the bar, and travelling above the bar; in the latter case the pupil will rise above the bar by one of the methods described under the horizontal bar proper.

As is always the case with exercises performed by a number of men at the same time, a stricter discipline must be preserved, with a closer observation of time. The more complex exercises should all be practised by the learners separately. The position of the instructor will be by the side of the machine, walking by the side of the pupil, giving directions and explanations as each step is made.

The horizontal bar should be of wrought iron 1½ inch in diameter, and fixed at a height of 8 feet from the floor. It may be of any length beyond 20 feet.

First Series . . . *Below the bar.*
Second Series . . . *Above the bar.*

First Series.

Position of attention facing the bar; for exercises sideways, facing the line of the bar.

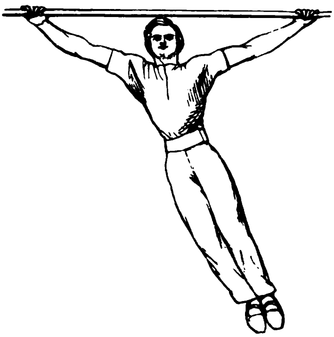
Right hand leading.

EXERCISE I.
COURSE I.

1. Spring from the ground and grasp the bar, the hands at the distance, the fingers and thumbs together, the arms straight, the trunk of the body upright, the legs straight and together, the feet together, the toes pointed to the ground.

2. Advance the right hand to its farthest reach along the bar, at the same time passing the lower limbs in position to the left until the feet are under the left hand (Fig. 1); quit the grasp of the left hand and immediately pass it along the bar to the right, at the same time allowing the lower limbs and trunk to swing to the right until they are under the right hand, again advance the right hand to the reach and repeat the movements of the step. Repeat.

Fig. 1.



On the completion of the last step, resume the first position, quit the grasp with both hands, and descend *yielding.*

This exercise to be repeated with the left hand leading.

Right and left.

EXERCISE 2.
COURSE II.

1. Grasp the bar as in the previous exercise.

2. Advance the right hand to its farthest reach along the bar, at the same time pass the lower limbs in position to the left until the feet are under the left hand (Fig. 2), quit the grasp of the left hand, letting the body and lower limbs fall to the left, let the left hand sweep round by the thigh in a half circle, and grasp the bar at a full reach beyond the right, at the same time making a complete turn with the body, and continuing the oscillation of the lower limbs until the feet are under the left hand (Fig. 3). Again pass the lower limbs to the left, quit the grasp of the right hand, and complete the movements of the step. Repeat.

Fig. 2.

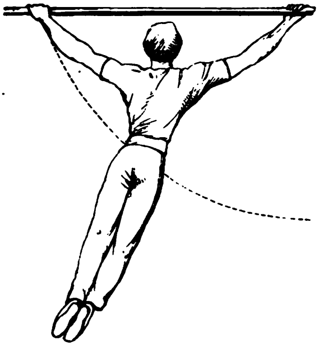
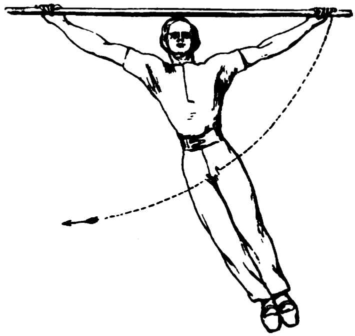


Fig. 3.



Descend as in the previous exercise.

Right and left, backwards.

EXERCISE 3.
COURSE II.

1. Grasp the bar as previously.

2. Advance the right hand to its farthest reach along the bar, quit the grasp of the left hand, but instead of passing it round by the front, as in

preceding exercise, let it fall by the rear and grasp the bar at the full reach beyond the right, the body making a complete turn backwards during the step. Repeat with the left and right alternately, and descend as before.

This exercise to be repeated, turning backwards and forwards at alternate steps.

Right hand leading.

The arms bent.

EXERCISE 4.
COURSE II.

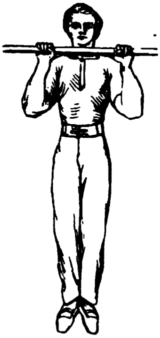
1. Grasp the bar as previously.

2. Bend the arms to the half reach, the chin rising above the bar (Fig. 4), advance the left hand up to the right, advance the right the distance of the step, retaining the trunk and lower limbs in position. Repeat.

At the completion of the last step sink to the extension of the arms, and descend yielding.

This exercise to be repeated with the left hand leading.

Fig. 4.



Both hands at once.

The arms bent.

EXERCISE 5.
COURSE II.

1. Grasp the bar as previously.

2. Bend the arms to the half reach, the chin rising above the bar, spring from both hands at once the distance of the step, retaining the arms bent and the trunk and lower limbs in position. Repeat.

Descend as in the preceding exercise.

Right hand leading, sideways.

EXERCISE 6.
COURSE I.

1. Spring from the ground and grasp the bar with both hands, the right in advance of but close to the left, the fingers and thumbs meeting; bend the arms until the head rises above the bar on the right side, and the left shoulder is immediately under the bar, the lower limbs straight and together and the toes pointed downwards (Fig. 5).

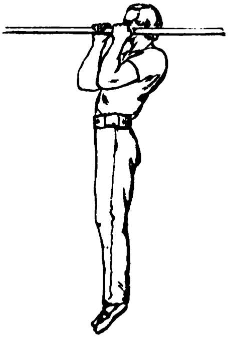


Fig. 5.

2. Advance the right hand the distance of the step, the left following, retaining the trunk and lower limbs in position. Repeat.

At the completion of the last step, sink to the extension of the arms, and descend yielding.

This exercise to be repeated with the left hand leading, the head on the left of the bar.

Hand over hand, sideways.

EXERCISE 7.
COURSE II.

1. Grasp the bar, and come to the side position as in Fig. 5.

2. Pass the left hand over the right the distance of the step, advancing the body until the right breast is at the right arm, pass the right hand over the left, advancing the body until the left breast is at the left arm. Repeat, retaining the trunk and lower limbs in position throughout, and descend as before.

Both hands at once, sideways.

EXERCISE 8. COURSE III.

1. Grasp the bar and come to the side position, as previously.

2. Spring to the front with both hands at once the distance of the step, retaining the trunk and lower limbs in position. Repeat.

Right hand leading, sideways.

The legs bent.

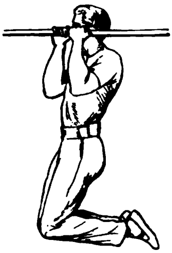
EXERCISE 9. COURSE I.

1. Grasp the bar and come to the side position, as previously, except that the lower limbs are bent at the knee, the feet to the rear, the toes pointed to the rear (Fig. 6).

2. Advance the right hand the distance of the step, the left following, retaining the trunk and lower limbs in position. Repeat.

At the completion of the last step, sink to the extension of the arms, lower the feet, and descend yielding.

Fig. 6.



This exercise to be repeated with the left hand leading, the head on the left of the bar.

Hand over hand, sideways.

The legs bent.

EXERCISE 10. COURSE II.

1. Grasp the bar and come to the side position, the legs bent as in Fig. 6.

2. Pass the left hand over the right the distance of the step, pass the right hand over the left the same distance, retaining the trunk and lower limbs in position. Repeat, and descend as before.

Both hands at once, sideways.

The legs bent.

EXERCISE 11. COURSE III.

1. Grasp the bar and come to the side position, the legs bent, as previously.

2. Spring to the front with both hands at once the distance of the step, retaining the trunk and lower limbs in position. Repeat, and descend as before.

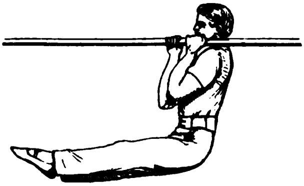
Right hand leading, sideways.

The legs up.

EXERCISE 12. COURSE III.

1. Grasp the bar and come to the side position as previously, except that the lower limbs are extended to the front in a horizontal line under the bar, the column of the body held firm and upright, the head held back (Fig. 7).

Fig. 7.



2. Advance the right hand the distance of the step, the left following, retaining the trunk and lower limbs in position. Repeat.

At the completion of the last step, sink to the extension of the arms, lower the feet, and descend yielding.

This exercise to be repeated with the left hand leading.

Hand over hand, sideways.

The legs up.

EXERCISE 13. COURSE III.

1. Grasp the bar and come to the side position, the legs up, as in Fig. 7.

2. Pass the left hand over the right to the distance of the step, pass the right hand over the left to the same distance, retaining the trunk and lower limbs in position. Repeat, and descend as before.

Both hands at once, sideways.

The legs up.

EXERCISE 14. COURSE III.

1. Grasp the bar and come to the side position, the legs up, as previously.

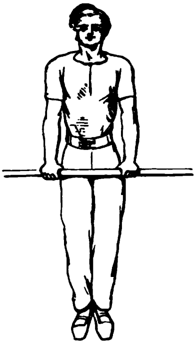
2. Spring to the front, both hands at once. the distance of the step, retaining the trunk and lower limbs in position. Repeat, and descend as before.

Second Series.

Position of attention facing the bar.

Right hand leading.

Fig. 8.



EXERCISE 15. COURSE III.

1. Rise above the bar right and left (p. 262) to the Rest above the bar (Fig. 8).

2. Advance the left hand up to the right; advance the right to the distance of the step, retaining the trunk and lower limbs in position. Repeat.

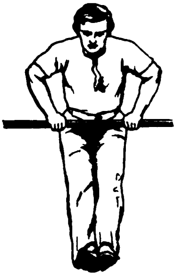
At the completion of the last step sink to the extension of the arms, and descend yielding.

This exercise to be repeated with the left hand leading.

Right hand leading.

The arms bent.

Fig. 9.



EXERCISE 16. COURSE IV.

1. Come to the Rest upon the bar, and thence slowly re-bend the arms to the Bent-Arm Rest (Fig. 9).

2. Advance the left hand to the right and the right hand to the distance of the step, retaining the arms and lower limbs in position. Repeat, and descend as before.

This exercise to be repeated with the left hand leading.

Right hand leading, backwards.

EXERCISE 17. COURSE IV. 1. Rise above the bar by the back circle (p. 272) to the backward Bent-Arm Rest above the bar, and thence by pressing on the hands to the ordinary backward Rest with the arms straight.

2. Pressing firmly from the left hand, incline the weight of the body as much as possible over the right arm, allowing it to bear the weight of the trunk; quickly release the grasp of the left hand and advance it several inches up to and slightly behind the body; advance the right several inches forward, regaining the original position. Repeat.

In descending, support the weight of the body entirely on the right arm, quit the grasp of the left hand and re-grasp the bar at the distance beyond the right, at the same time turning the breast fully round to the bar and resting equally on both hands. Slowly rebend the arms, sink beneath the bar, quit the grasp, and descend yielding.

This exercise to be repeated, left hand leading.

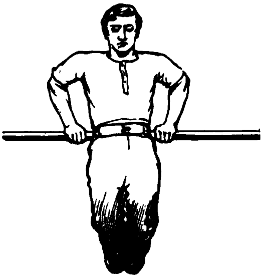
Right hand leading, backwards.

The arms bent.

EXERCISE 18. COURSE IV. 1. Come to the backward Rest above the bar as in preceding exercise. Slowly sink to the Bent-Arm Rest backwards (Fig. 10).

2. Inclining the body over the right arm, make the advance as in previous exercise, retaining the position of the arms and lower limbs. Repeat.

Fig. 10.



In descending, press upon the bar and re-elevate the arms to the full extension, lean the weight of the body over the right arm as in the previous exercise, turn fully round, re-grasp the bar, sink beneath it and drop yieldingly to the ground.

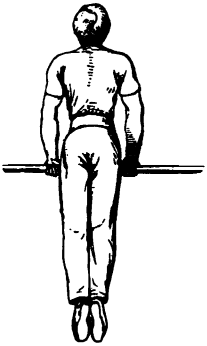
This exercise to be repeated, left hand leading.

The circular march.

EXERCISE 19.
COURSE IV.

1. Come to the position of the Rest above the bar, as previously (Fig. 11).

Fig. 11.



2. Incline the body over the right arm and support the entire weight upon it, quit the grasp of the left hand and re-grasp the bar at the distance beyond the right with the hand reversed, at the same time turning the back fully round towards the bar, and rest equally on both hands. Support the weight of the body on the left arm, re-grasp with the right hand with ordinary grasp, turning the breast fully round towards the bar. Repeat.

In descending slowly re-bend the arms, sink beneath the bar and drop yieldingly to the ground.

Right hand leading.

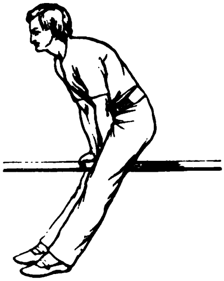
The legs astride the bar.

EXERCISE 20.
COURSE IV.

1. Come to the Rest above the bar, as previously. Raise the right leg to the level above the bar, retaining it straight, the toes pointed outward, and bring it slowly over the bar, quitting the grasp of the right hand and advancing it to the position

immediately beyond the left, and quickly reverse the grasp of the left hand. Incline the head and trunk forward over the arms (Fig. 12), and quitting the grasp of the right hand advance it several inches along the bar. Again inclining the body forward, advance the left hand up to the right. Repeat.

Fig. 12.



In descending, bring the right leg to the rear in position, and as it passes above the bar quit the grasp of the right hand, and retake it at the distance, reversing the grasp of the left hand, and coming to the original position of the Rest above the bar. Thence descend to the ground as before.

This exercise to be repeated, left hand leading.

Hand over hand.

The legs astride the bar.

EXERCISE 21.
COURSE IV.

1. Come to the Rest on the bar, and thence to the position astride the bar, as previously.

2. Incline the head and trunk well forward. Pass the left hand over the right the distance of the step, advancing the body till the breast is over the right arm; pass the right hand a step beyond the left, advancing the body till the breast is over the left arm. Repeat, and descend as before.

Both hands at once.

The legs astride the bar.

EXERCISE 22.
COURSE IV.

1. Come to the Rest on the bar, and thence to the position astride the bar, as in the preceding exercise.

2. Inclining the head and trunk well forward and pressing

firmly with both hands, spring forward several inches along the bar, retaining the body in position. Repeat, and descend as in the preceding exercise.

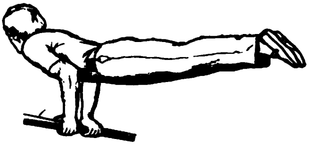
To travel in the straight line above the bar.

EXERCISE 23.
COURSE IV.

1. Rise to the Rest above the bar by the ordinary circle, hands reversed ; and thence to the straight line above the bar resting on the forearms (Fig. 13).

2. Press with the left arm and incline the body over the right arm, and, supporting the weight entirely upon it, quit the grasp of the left hand and advance it along the bar till it is just below the left breast ; now support the body upon the left arm and advance the right to the distance of the step. Repeat.

Fig. 13.



In descending, allow the lower limbs gradually to fall to the rear, coming to the position of the Rest, and thence come to the ground as usual.

THE BRIDGE LADDER.

For elementary purposes this form of ladder is very superior to any other; first, because on it the movements of both the ascent and descent in each exercise may be performed in one continuous effort; second, it admits of the free practice of the most difficult exercises with perfect safety, which is not the case with the exercises of the second series on a ladder of any other form; and third, an entire class of men may practise on it at the same time. The range of exercises which it presents is of the widest, and extends over all the courses of the system.

The first series, *by the sides*, is valuable to beginners, whether its exercises are performed with the arms retained at the reach, as should be the case in the initiatory lessons, or with them bent at the half reach, as should be the case when the muscular power of the learner has been so far increased as to enable him to execute them in their perfect form, as given in the text. In the very first exercise of this series the upper region of the trunk receives exercise of the highest order, and every valuable quality is heightened as the series advances; the lower limbs and column of the body being held straight and compact, while the upper portion of the trunk is urged to energetic employment in the best position, for the same action which lifts the breast upwards and forwards, also flattens the back and sustains the shoulders square to the front; while the grip of the hands at the width of the ladder, slightly exceeding the natural width of the shoulders, tends at every movement to promote the expansion of this part of the body.

The second series, *by the spars*, is much more arduous than the first, as, during the step, the weight of the body is wholly sustained by one hand in the most difficult of positions, viz. with the forearm bent at a right angle to the upper arm. The double-handed exercises are specially arduous, requiring and yielding in their practice, not only great tension of muscle, but also great rapidity of action, precision and security of grasp, quickness of eye, presence of mind, and decision.

The exercises of the third series, *the legs up*, neither require nor give any of the qualities just enumerated, except the muscular power, and this they both give and require in a very high degree.

Until the action and position of the step have been fairly acquired, the learners should be passed along the ladder singly, the instructor walking by the side and indicating the various points in the exercise to be observed. In the second series, and especially with the double-handed exercises, until the learners have attained to considerable strength and dexterity, they should not be allowed to pass the arch of the bridge.

When the exercises can be executed with sufficient accuracy, the learners should follow each other in rapid succession, at intervals of a few feet, returning to the starting-point, ready to begin another exercise as soon as the last of the class shall have traversed the ladder.

The position of the instructor is by the side of or behind the learner in the initiatory lessons; in the more advanced lessons on the right of the machine.

The bridge ladder should span not less than 30 feet or more than 40 feet. With a span of 30 feet the uprights should be 7 feet 6 inches above the floor, and the apex or centre of the span 12 feet above the floor, the latter being slightly increased for a greater span. The width of the ladder should be 14 inches, and the thickness of the sides 2 inches, rounded to fit the hands; the spars should be 9 inches apart.

FIRST SERIES . . .	*By the sides.*
SECOND SERIES . . .	*By the spars.*
THIRD SERIES . . .	*The legs up.*

First Series.

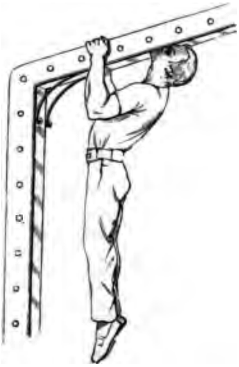
Position of attention, under the ladder, back to the upright for exercises forwards, facing the upright for exercises backwards; at the side of the ladder or sideways beneath the ladder for exercises sideways.

Right hand leading, backwards.

EXERCISE I.
COURSE I.

1. Spring from the ground and grasp the sides of the ladder, bending the arms as at the half reach, the head held back, the breast advanced, the column of the body held firm and upright, the legs together and straight, the feet together, the toes pointed to the ground (Fig. 1).

Fig. 1.



2. Advance the right hand about the distance of the space between the spars, the left following on the left to a position exactly opposite the right. Repeat.

This exercise to be repeated with the left hand leading.

Throughout all exercises on this machine, the body is to be held perfectly firm in the line of the ladder—no oscillation whatever from side to side taking place. The tendency of the body to oscillate being greater after passing the apex of the ladder, it is in the descent that it should be especially guarded against.

In descending from the ladder at the completion of each exercise, point the toes to the ground (if from the sitting position, allowing the lower limbs to fall to the vertical line), lower the body to the reach of the arms, quit the grasp, and descend yielding.

Right and left, backwards.

EXERCISE 2.
COURSE I.

1. Grasp the ladder by the sides backwards, as in the previous exercise.

2. Advance the right hand about the distance of the space between the spars ; advance the left hand the same distance beyond the right, and the right hand the same distance beyond the left ; the body and lower limbs in position (Fig. 1). Repeat.

Both hands at once, backwards.

EXERCISE 3.
COURSE II.

1. Grasp the ladder by the sides backwards, as before.

2. Spring upward and rearward with both hands the distance of the space between the spars, retaining the arms well bent, and the column of the body and the lower limbs in position. Repeat.

Right hand leading, forwards.

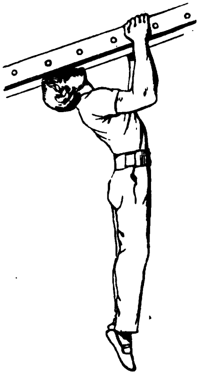
EXERCISE 4.
COURSE I.

1. Spring from the ground and grasp the sides of the ladder, bending the arms as at the half reach, the head held back, the breast strongly lifted upwards and forwards, the lower portion of the trunk and legs held firm and straight, the feet together, the toes pointed to the ground (Fig. 2).

2. Advance the right hand about the distance of the space between the spars, the left following on the left to a position exactly opposite the right. Repeat.

This exercise to be repeated with the left hand leading.

Fig. 2.



Right and left, forwards.

EXERCISE 5.
COURSE I.

1. Grasp the ladder by the sides forwards, as in the previous exercise.

2. Advance the right hand about the distance of the space between the spars; advance the left hand the same distance beyond the right, and the right hand the same distance beyond the left, the body and lower limbs in position (Fig. 2). Repeat.

Both hands at once, forwards.

EXERCISE 6.
COURSE II.

1. Grasp the ladder by the sides forwards, as previously.

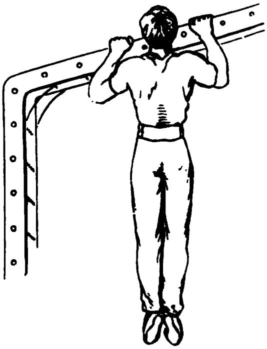
2. Spring upward and forward with both hands the distance of the space between the spars, retaining the column of the body and the lower limbs in position. Repeat.

Right hand leading, sideways.

EXERCISE 7.
COURSE IV.

1. Spring from the ground and grasp the side of the ladder with the hands at the distance; immediately bend the arms until the hands are as at the rest, the chin above the ladder, the head erect, the trunk of the body held firm and compact, the legs straight and together, the feet together, the toes pointed to the ground (Fig 3).

Fig. 3.



2. Advance the right hand about the distance of the space between the spars, advance the left the same distance, retaining the chin above the ladder, and the trunk of the body and lower limbs in position. Repeat.

This exercise to be repeated on the opposite side of the ladder, the left hand leading.

Hand over hand, sideways.

EXERCISE 8.
COURSE IV.

1. Grasp the ladder by the side as in the previous exercise.

2. Pass the right hand over the left, withdraw the left and advance it beyond the right, retaining the body and lower limbs in position. Repeat.

Both hands at once, sideways.

EXERCISE 9.
COURSE IV.

1. Grasp the ladder by the side, as previously.

2. Spring with both hands to the left the distance of the space, and immediately without pause repeat the step.

Second Series.

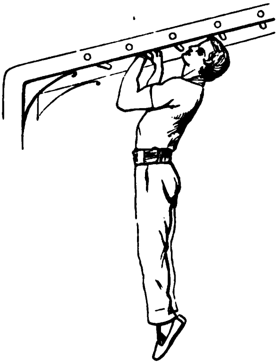
Position of attention, back to, facing, or at the side of the upright.

Right hand leading, backwards.

EXERCISE 10.
COURSE III.

1. Spring from the ground and with both hands grasp the first spar, bending the arms as at the half reach, the palms to the front, the fingers and thumbs together, the head held back, the breast advanced, the eyes directed to the next spar, the column of the body held firm and upright, the legs together and straight, the feet together, the toes pointed to the ground (Fig. 4).

Fig. 4.



2. Advance the right hand to the next spar, the left following to the same spar, the body and lower limbs in position. Repeat.

This exercise to be repeated with the left hand leading; also with the hands reversed; also passing a spar at each step.

Right and left, backwards.

EXERCISE 11.
COURSE III.

1. Grasp the ladder by the first spar backwards, as in the previous exercise.

2. Advance the right hand to the next spar, advance the left hand to the spar beyond that grasped by the right, and the right hand to the spar beyond that grasped by the left, the body held square to the front in position. Repeat.

This exercise to be repeated with the hands reversed.

Both hands at once, backwards.

EXERCISE 12.
COURSE IV.

1. Grasp the ladder by the first spar backwards, as in the previous exercise.

2. Spring to the second spar with both hands, and without pause spring to the third, retaining the arms well bent, and the trunk and lower limbs in position, and avoiding all front and rear oscillation. Repeat.

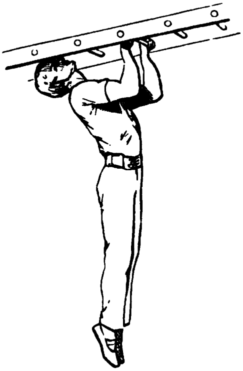
Right hand leading, forwards.

EXERCISE 13.
COURSE III.

1. Spring from the ground and with both hands grasp the first spar, bending the arms as at the half reach, the palms to the front, the fingers and thumbs together, the head held back, the breast advanced, the eyes directed to the next spar, the whole column of the body held firm and upright, the legs together and straight, the feet together, the toes pointed to the ground (Fig. 5).

2. Advance the right hand to the next spar. the left following to the same spar, the trunk and lower limbs firmly held in position. Repeat.

Fig. 5.



This exercise to be repeated with the left hand leading; also with the hands reversed; also passing a spar.

Right and left, forwards.

EXERCISE 14.
COURSE III.

1. Grasp the ladder by the first spar, forwards, as in the previous exercise.

2. Advance the right hand to the next spar, advance the left hand to the spar beyond that grasped

by the right, and the right hand to the spar beyond that grasped by the left, the body held square to the front in position. Repeat.

This exercise to be repeated with the hands reversed.

Both hands at once, forwards.

EXERCISE 15.
COURSE IV.

1. Grasp the ladder by the spar forwards, as previously.

2. Spring to the second spar with both hands, and without pause spring to the third, retaining the arms well bent, and the trunk and lower limbs in position, and avoiding all front and rear oscillation. Repeat.

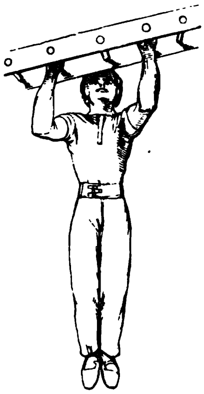
Right hand leading, sideways.

EXERCISE 16.
COURSE III.

1. Spring from the ground and grasp the first spar with the left hand, and the third spar with the right hand, bending the arms as at the half reach; the palms of both hands facing inwards, the fingers and thumbs together, the head held back, the breast advanced, the lower portion of the trunk and legs held firm and straight, the legs together, the feet together, the toes pointed to the ground (Fig. 6).

2. Advance the right hand to the next (the fourth) spar, advance the left hand to the next (the second) spar, retaining the arms well bent, and the column of the body and lower limbs in position. Repeat.

Fig. 6



This exercise to be repeated with the left hand leading.

Both hands at once, sideways.

EXERCISE 17. COURSE IV. 1. Grasp the first and third spars sideways, as in the previous exercise.

2. Spring from both hands, and with the right hand grasp the next (the fourth) spar, and with the left hand grasp the next (the second) spar, the rest of the body as in preceding exercise. Repeat.

Third Series.

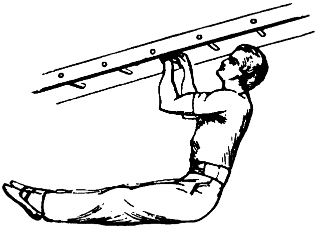
Position of attention, back to, facing, or at the side of the upright.

Right hand leading, backwards.

By the spars.

EXERCISE 18. COURSE III. 1. Grasp the first spar backwards, as previously, except that the lower limbs are extended to the front horizontally, straight and together, the toes pointed to the front (Fig. 7).

Fig. 7.



2. Advance the right hand to the next spar, the left following to the same spar, retaining the trunk and lower limbs in position. Repeat.

This exercise to be repeated with the left hand leading.

Right and left, backwards.

By the spars.

EXERCISE 19. COURSE IV. 1. Grasp the first spar backwards, and come to the position as in the previous exercise.

2. Advance the right hand to the next spar, the left hand to the spar beyond that grasped by the right, and the right to the spar beyond that grasped by the left, retaining the trunk and lower limbs in position. Repeat.

Both hands at once, backwards.

By the spars.

EXERCISE 20. COURSE IV. 1. Grasp the first spar backwards, and come to the position as previously.

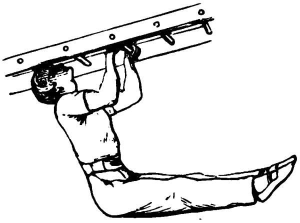
2. Spring to the second spar with both hands, and without pause spring to the third, keeping the arms well bent and retaining the trunk and lower limbs in position. Repeat.

Right hand leading, forwards.

By the spars.

EXERCISE 21. COURSE III. 1. Grasp the first spar forwards as in right hand leading, forwards, except that the lower limbs are extended to the front horizontally, straight and together, the toes pointed to the front (Fig. 8).

Fig. 8.



2. As in right hand leading forwards, but retaining the trunk and lower limbs in position. Repeat.

This exercise to be repeated with the left hand leading.

Right and left, forwards.

By the spars.

EXERCISE 22. COURSE IV. 1. Grasp the first spar forwards, and come to the position as in the previous exercise.

2. As in the right and left forwards, but retaining the trunk and lower limbs in position. Repeat.

Both hands at once, forwards.

By the spars.

EXERCISE 23.
COURSE IV.

1. Grasp the first spar forwards and come to the position as previously.

2. As in both hands at once, forwards, but retaining the trunk and lower limbs in position. Repeat.

Left hand leading, sideways.

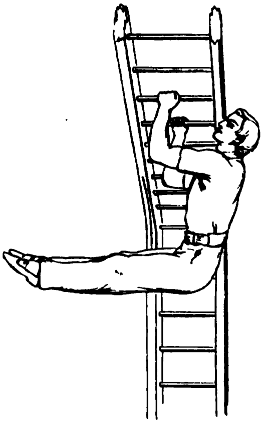
By the spars.

EXERCISE 24.
COURSE III.

1. Grasp the first spar with the right and the third spar with the left, sideways, as in left hand leading, sideways, except that the lower limbs are extended to the front horizontally, straight and together, the toes pointed to the front (Fig. 9).

2. Advance the left hand to the next (the fourth) spar, advance the right hand to the next (the second) spar, retaining the trunk and lower limbs in position. Repeat.

Fig. 9.



This exercise to be repeated with the right hand leading.

Both hands at once, sideways.

By the spars.

EXERCISE 25.
COURSE IV.

1. Grasp the spars as in the previous exercise.

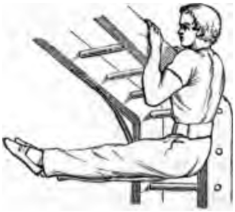
2. Spring from both hands and with the left hand grasp the next (the fourth) spar, and with the right hand grasp the next (the second) spar, retaining the trunk and lower limbs in position. Repeat.

Left hand leading, sideways.

By the sides.

EXERCISE 26. COURSE III. 1. Grasp the ladder by the side and come to the position as in left hand leading, sideways, except that the lower limbs are extended to the front horizontally, straight and together, the toes pointed to the front (Fig. 10).

Fig. 10.



2. Advance the left hand the distance of the space between the bars, and the right hand the same distance, retaining the chin above the ladder, and the trunk and lower limbs in position. Repeat.

This exercise to be repeated with the right hand leading.

Hand over hand, sideways.

By the sides.

EXERCISE 27. COURSE IV. 1. Grasp the ladder by the side and come to the position of the previous exercise.

2. Pass the right hand over the left, withdraw the left and advance it beyond the right, retaining the chin above the ladder, and the trunk and lower limbs in position. Repeat.

Both hands at once, sideways.

By the sides.

EXERCISE 28. COURSE IV. 1. Grasp the ladder by the side and come to the position as previously.

2. Spring with both hands to the left to the distance of the space and immediately without pause repeat the step, retaining the chin above the ladder, and the trunk and lower limbs in position. Repeat.

THE PLANK.

THERE is no machine more simple than this, and none which may be made more directly and practically useful. All its exercises are of a simple kind, requiring and giving in their practice suppleness rather than strength.

The plank should be 14 inches wide and 1½ inches thick. Its length may vary from 14 feet to 20 feet; its inclination should be frequently varied.

FIRST SERIES . . .	*With hands and feet.*
SECOND SERIES . . .	*With hands and knees.*
THIRD SERIES . . .	*With hands only, the legs up.*
FOURTH SERIES . . .	*With the hands only, the legs suspended.*

First Series.

Position of attention, facing the plank, the toes touching it.

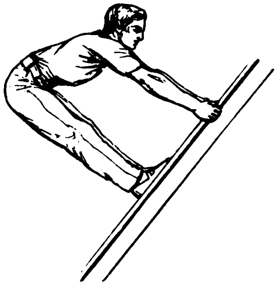
Right hand leading.

EXERCISE I.
COURSE I.

1. Lean forward, raise the right hand and grasp the edge of the plank at the half reach, the left following on the left, the fingers under, the thumbs above and pointed upwards; lift the right foot from the ground, and place it on the plank, lift the left foot and place it beside the right, the legs straight, the feet

flat upon the plank, the arms straight and firm, the head held back, the eyes directed to the reach of the hands (Fig. 1).

Fig. 1.



2. Raise the right hand to the reach, the left following on the left; incline the body to the front, draw up the right foot the distance of the step, the left following on the left. Repeat.

In descending, slip down the right foot the distance of the step, the left following on the left, slip down the right hand, the left following on the left. Repeat.

This exercise to be repeated with the left hand leading.

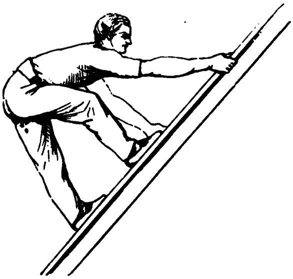
Right side leading.

EXERCISE 2.
COURSE I.

1. Come to the position with the feet on the plank, as in the previous exercise.

2. Slightly incline the body to the left, raise the right hand to the reach, and at the same time lift the right foot the distance of the step (Fig. 2); slightly incline the body to the right, raise the left hand to the reach opposite the right and at the same time lift the left foot and place it beside the right. Repeat.

Fig. 2.



In descending, slip the right hand down the distance of the step and at the same time slip the right foot down the same distance, the left hand and the left foot following together on the left. Repeat.

This exercise to be repeated with the left side leading.

Right and left side.

EXERCISE 3.
COURSE I.

1. Come to the position with the feet on the plank, as previously.

2. Slightly incline the body to the left, raise the right hand to the reach, and at the same time lift the right foot the distance of the step, as in Fig. 2 ; incline the body to the right, raise the left hand and left foot the distance of the step beyond the right hand and right foot. Repeat the step with the left hand and foot, passing the right.

In descending, slip down the leading hand and foot the distance of the step below the supporting hand and foot. Repeat.

Right and left, hand and foot.

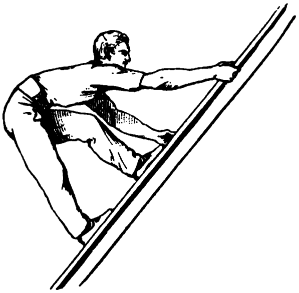
EXERCISE 4.
COURSE I.

1. Come to the position with the feet on the plank, as previously.

2. Raise the right hand a short step, and at the same time lift the left foot the same distance (Fig. 3), raise the left hand the distance of the step beyond the right, and at the same time lift the right foot beyond the left. Repeat.

In descending, slip the leading hand and foot down a short step below the supporting hand and foot. Repeat.

Fig. 3.



Both hands at once.

EXERCISE 5. COURSE II. 1. Lean forward, raise both hands and grasp the edges of the plank as before, lift both feet and place them on the plank, then rest the body as in first exercise.

2. Shoot up both hands to the reach, inclining the body to the front, draw up both feet the distance of the step. Repeat.

In descending, slip down both feet the distance of the step, bring the hands down the same distance. Repeat.

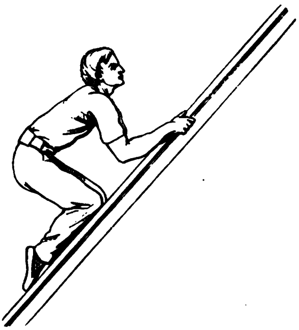
Second Series.

Position of attention facing the plank, the toes touching it.

Right hand leading.

EXERCISE 6. COURSE II. 1. Lean forward and grasp the plank as before; lift the right leg and place the knee upon the plank, the front of the leg from the knee to the point of the toes resting on its surface, the left following on the left, the head held back, the arms at the half reach (Fig. 4).

Fig. 4.



2. Raise the right hand to the reach, the left following on the left; raise the right knee the distance of the step, the left following. Repeat.

In descending, slip the right knee down the distance of the step, the left following; slip the right hand down the same distance, the left following. Repeat.

This exercise to be repeated with the left hand leading.

Right side leading.

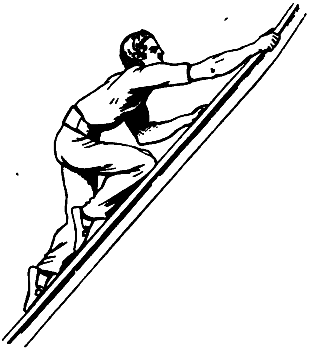
EXERCISE 7.
COURSE II.

1. Come to the position with the knees on the plank, as in the previous exercise.

2. Raise the right hand to the reach, and at the same time lift the right knee the distance of the step (Fig. 5); raise the left hand to the reach opposite the right, and at the same time lift the left knee and place it beside the right. Repeat.

In descending, slip the right hand down the distance of the step and at the same time slip the right knee down the same distance, the left hand and left knee following together on the left. Repeat.

Fig. 5.



This exercise to be repeated with the left side leading.

Right and left side.

EXERCISE 8.
COURSE II.

1. Come to the position with the knees on the plank, as previously.

2. Raise the right hand to the reach and at the same time lift the right knee the distance of the step, as in Fig. 5; raise the left hand and left knee the distance of the step beyond the right hand and right knee. Repeat the step with the left hand and foot, passing the right.

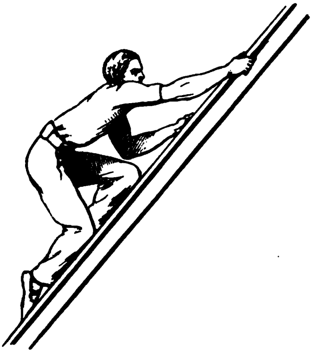
In descending, slip down the leading hand and knee the distance of the step below the supporting hand and foot. Repeat.

Right and left, hand and knee.

EXERCISE 9.
COURSE II.

1. Come to the position with the knees on the plank, as before.

Fig. 6.



2. Raise the right hand a short step, and at the same time lift the left knee the same distance (Fig. 6); raise the left hand the distance of the step beyond the right, and at the same time lift the right knee beyond the left. Repeat.

In descending, slip the leading hand and knee down a short step below the supporting hand and knee. Repeat.

Both hands at once.

EXERCISE 10.
COURSE III.

1. Lean forward, raise both hands and grasp the edges of the plank, lift both feet and place the knees upon the plank, as before.

2. Shoot up both hands to the reach, set the legs free from the plank, and draw up both knees the distance of the step. Repeat.

In descending, set the legs free from the plank, and slip down both knees the distance of the step, bring the hands down the same distance. Repeat.

Third Series.

Position of attention facing the plank, the toes touching it.

Both hands at once, the legs suspended.

EXERCISE 11. COURSE IV. 1. Raise both hands and grasp the plank as in preceding exercise; lift both legs from the ground and pass them right and left over the plank, resting on the edge of it under the knee, the fore-legs pendent on either side, the arms bent, the trunk of the body sustained, the head held back (Fig. 7).

Fig. 7.

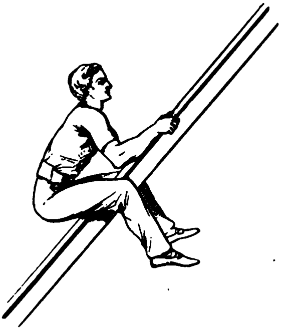
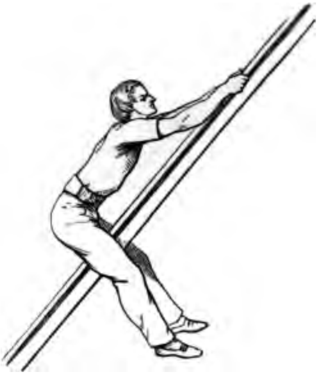


Fig. 8.



2. Lean forward and shoot up both hands to the reach (Fig. 8), raise the lower limbs the same distance. Repeat. In descending, pass the lower limbs down the distance of the step, lower the hands. Repeat.

Fourth Series.

Position of attention facing the plank, the toes touching it.

Right hand leading.

EXERCISE 12. COURSE III. 1. Lean forward and with the right hand at the reach grasp the edge of the plank, the left following on the left, the column of the body aligned down the centre of the plank, the head slightly bent back, the legs straight and together, the toes pointed downwards, the surface of the feet resting on the plank (Fig. 9).

2. Bend the arms and raise the body to the half reach; raise the right hand to the reach (Fig. 10), the left following on the left, draw up the body to the half reach. Repeat.

In descending, slip the right hand down to the rest, the left following on the left, lower the body to the reach of the hands. Repeat.

This exercise to be repeated with the left hand leading.

Fig. 9.

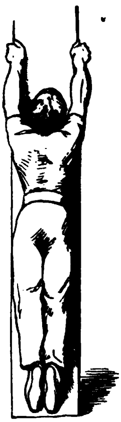
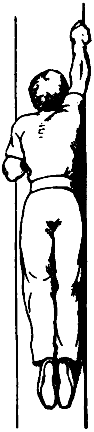


Fig. 10.



Right and left.

EXERCISE 13. COURSE III. 1. Come to the position with the body aligned down the centre of the plank, as in the previous exercise.

2. Bend the arms and raise the body as in preceding exercise; raise the right hand to the reach and at the same time elevate the body to the rest of the left, raise the left hand to the reach beyond the right, at the same time elevate the body to the rest of the right. Repeat, the leading hand passing the supporting hand at each step.

In descending, slip the right hand down to the rest, lower the body to the reach of the left; slip the left hand down below the right, and lower the body to the reach of the right. Repeat.

Right and left side.

EXERCISE 3.
COURSE I.

1. Come to the position on the plank, as previously.

2. Raise the right hand to the next spar, and at the same time lift the right foot to the second spar (Fig. 3); straighten the right knee, bend the right arm and elongate the trunk, and at the same time raise the left hand to the spar above that grasped by the right, and lift the left foot to the spar above that occupied by the right. Repeat the step, the leading hand and foot always passing the spars occupied by the supporting hand and foot.

In descending, slip the leading hand down to the spar below that grasped by the supporting hand, and at the same time slip the leading foot to the spar below that occupied by the supporting foot. Repeat.

Right and left, hand and foot.

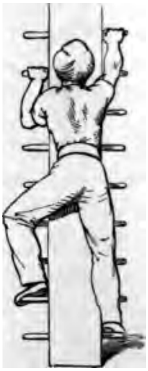
EXERCISE 4.
COURSE I.

1. Come to the position on the plank, as previously.

2. Raise the right hand to the next spar, and at the same time lift the left foot to the second spar (Fig. 4); straighten the left knee, bend the right arm, and elongate the trunk, and at the same time raise the left hand to the spar above that grasped by the right, and lift the right foot to the spar above that occupied by the left. Repeat the step, the leading hand and foot always passing the spars occupied by the supporting hand and foot.

In descending, slip the leading hand down to the spar below that grasped by the supporting hand, and at the same time slip the leading foot to the spar below that occupied by the supporting foot. Repeat.

Fig. 4.



THE LADDER PLANK.

THIS machine admits of different forms of construction, and this variety of construction greatly extends its range of exercises and their adaptability to meet the requirements of individuals of different degrees of strength. It is found that the effort required to perform some of the exercises is in direct relation to the depth of the machine. In every gymnasium, therefore, there should be several of these machines, varying in thickness from 1½ inch to 6 inches.

The exercises on this machine, as on the preceding one, are purely elementary, although the machine itself is a union of two of the most strictly practical ones in the System. They address themselves to the entire body, though not equally, the upper region of the trunk being the part most directly affected by them, and that so favourably that there is no machine in the gymnasium which so rapidly or so powerfully aids in the expansion and development of this all-important part of the body, and as the exercises are all of a simple and safe nature, they cannot be practised too frequently.

A single glance at the position and action of the body when extended on this machine will show not only what it is meant to effect, but its mode of effecting it; for while the back is forced to take absolutely the conformation of the plank upon which it is extended, the obverse side of the body is, by the very act which flattens the back, rounded and advanced to its most advantageous position and shape; this is especially the case with the exercises of the third series, where the effect of the uplifted arms is still further to depress the shoulders and advance the front and sides of the chest; the position of the neck and head contributes to the same result, and the downward pull of the hands in the ascent, with the gradual extension of the arms on the lowering of the body in the descent, increase the effort and augment the good to be derived from these exercises. The muscles of the back are also employed in the most advantageous manner.

The position of the instructor is on the left of the plank.

As before stated there are several varieties of this machine. The simplest form is that of a plank 1½ inch thick and 18 inches wide, the extreme thickness or depth of the plank being 6 inches with a width of 12 inches only, the intermediate thicknesses being of proportionate width. The spars should be 9 inches apart and project 6 inches on each side of the plank.

FIRST SERIES . . . *With hands and feet.*
SECOND SERIES . . . *With hands only.*
THIRD SERIES . . . *Backwards.*

First Series.

Position of attention facing the plank, the toes touching it.

Right hand leading.

EXERCISE I. COURSE I. 1. Stoop forward and with the right hand grasp the spar nearest the reach, the fingers and thumb together, the left hand following on the left; place the right foot on the lowest spar, resting on the hollow of the foot, the left following on the left;

Third Series.

Position of attention, the back to the plank, the heels touching it.

Backwards.

Descending by the spar.

EXERCISE 9. COURSE I. 1. Lean back and rest on the plank, elevate both hands and grasp the spars right and left nearest the reach, the palms to the front, the thumb and fingers meeting round the spar, the head resting on the plank, the eyes directed to the front, the trunk of the body aligned down the centre of the plank and resting on its surface, the feet on the lowest spar (Figs. 9 and 10).

Fig. 9.

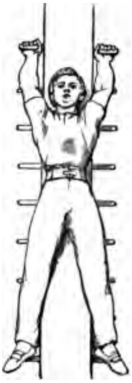
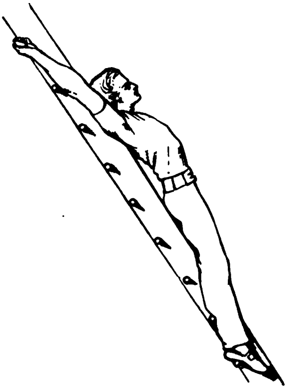


Fig. 10.



2. Raise both feet to the second spar, straighten the knees and elongate the trunk. Repeat.

In descending, slip both feet down to the next spar, lowering the body to the reach of the hands, slip both hands down *to the next spar. Repeat.*

Right and left side.

EXERCISE 3.
COURSE I.

1. Come to the position on the plank, as previously.

2. Raise the right hand to the next spar, and at the same time lift the right foot to the second spar (Fig. 3); straighten the right knee, bend the right arm and elongate the trunk, and at the same time raise the left hand to the spar above that grasped by the right, and lift the left foot to the spar above that occupied by the right. Repeat the step, the leading hand and foot always passing the spars occupied by the supporting hand and foot.

In descending, slip the leading hand down to the spar below that grasped by the supporting hand, and at the same time slip the leading foot to the spar below that occupied by the supporting foot. Repeat.

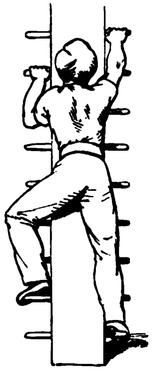
Right and left, hand and foot.

EXERCISE 4.
COURSE I.

1. Come to the position on the plank, as previously.

2. Raise the right hand to the next spar, and at the same time lift the left foot to the second spar (Fig. 4); straighten the left knee, bend the right arm, and elongate the trunk, and at the same time raise the left hand to the spar above that grasped by the right, and lift the right foot to the spar above that occupied by the left. Repeat the step, the leading hand and foot always passing the spars occupied by the supporting hand and foot.

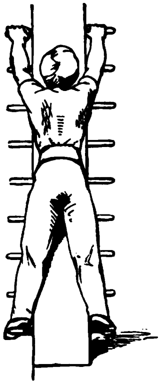
Fig. 4.



In descending, slip the leading hand down to the spar below that grasped by the supporting hand, and at the same time slip the leading foot to the spar below that occupied by the supporting foot. Repeat.

Both hands at once.

Fig. 5.



EXERCISE 5.
COURSE I.

1. Come to the position on the plank, as previously.

2. Raise both hands to the next spar (Fig. 5), lift both feet to the second spar, straighten the knees and elongate the trunk. Repeat.

In descending, place both feet in the centre of the plank, the legs straight and together, the feet pointed downwards; lower the body to the reach and place the feet on the nearest spar. Repeat.

Second Series.

Position of attention facing the plank, the toes touching it.

Right hand leading.

EXERCISE 6.
COURSE II.

1. Stoop forward and with the right hand grasp the spar nearest the reach, the left hand following on the left; the column of the body carefully aligned down the centre of the plank, the head

Fig. 6.

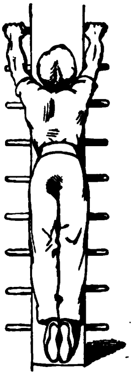


Fig. 7.

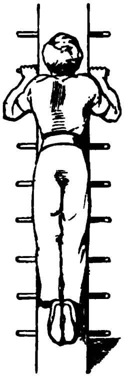
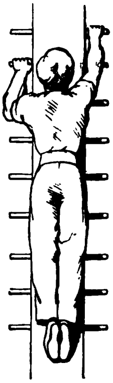


Fig. 8.



slightly bent back, the breast advanced, the legs together and straight, the feet together and pointed downwards, the surface of the foot resting on the plank (Fig. 6).

2. Bend the arms and raise the body to the half reach (Fig. 7), and on the instant raise the right hand to the next spar (Fig. 8), the left hand following on the left. Repeat.

In descending, slip the right hand down to the next spar, the left hand following on the left, retaining the arms bent at the half reach, as in Fig. 7. Repeat.

This exercise to be repeated with the left hand leading.

Right and left.

EXERCISE 7.
COURSE III.

1. Come to the position on the plank, the legs suspended as in the previous exercise.

2. Bend the arms and raise the body to the half reach, and raise the right hand to the next spar, as before ; elevate the body to the rest of the left hand, and on the instant raise it to the spar above that grasped by the right. Repeat.

Both hands at once.

EXERCISE 8.
COURSE IV.

1. Raise both hands and grasp the spar nearest the reach, the body in position and the legs suspended as previously (Fig. 6).

2. Bend the arms and raise the body to the half reach of the hands, and on the instant shoot up both hands to the next spar and elevate the body to the half reach of the hands. Repeat.

In descending, slip both hands down to the next spar, retaining the arms bent at the half reach. Repeat.

Third Series.

Position of attention, the back to the plank, the heels touching it.

Backwards.

Descending by the spar.

EXERCISE 9. COURSE I. 1. Lean back and rest on the plank, elevate both hands and grasp the spars right and left nearest the reach, the palms to the front, the thumb and fingers meeting round the spar, the head resting on the plank, the eyes directed to the front, the trunk of the body aligned down the centre of the plank and resting on its surface, the feet on the lowest spar (Figs. 9 and 10).

Fig. 9.

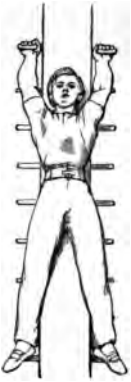
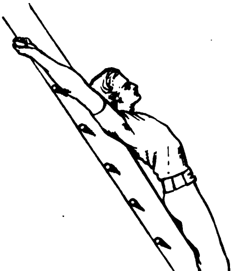


Fig. 10.



2. Raise both feet to the second spar, straighten the knees and elongate the trunk. Repeat.

In descending, slip both feet down to the next spar, lowering the body to the reach of the hands, slip both hands down to the next spar. Repeat.

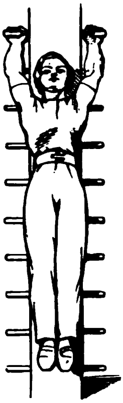
Backwards.

Descending by the centre.

EXERCISE 10.
COURSE II.

1. Come to the position on the plank backwards, as in the previous exercise.

Fig. 11.



2. Complete the ascent as in the previous exercise.

In descending, (1) bring both feet to the centre of the plank, the toes pointed downwards, the heels together and resting on the plank, the knees straight and together, the whole column of the body from the heels upwards perfectly aligned down the centre of the plank.

2. Lower the body to the reach of the hands (Fig. 11); separate the feet right and left and place them on their respective spars, slip both hands down to the next spar. Repeat.

THE INCLINED LADDER.

It may seem unnecessary to teach by formal instructions exercises so simple as many of those directed in the text to be performed on this machine, but their usefulness may be readily proved. Let a dozen men be taken at hazard and desired to climb a ladder at any given incline, and it will be found that scarcely two will do so in the same manner, scarcely two will maintain throughout the ascent the position and action with which they began, while uncertainty, hesitation, and insecurity will more or less mark the efforts of all. The practised gymnast, on the contrary, will mount it as surely and as rapidly as if it were a staircase, in any one of a dozen different ways, on its being merely indicated by the name which it bears in his book of instructions.

This machine is an ordinary ladder, but it should be carefully constructed, and the materials well selected. The width of the ladder between the supports should be 14 or 15 inches, and the spars 9 inches apart.

The inclination of the ladder should be frequently varied.

FIRST SERIES . . .	*Above the ladder.*
SECOND SERIES . . .	*Under the ladder.*
THIRD SERIES . . .	*The hands only.*

First Series.

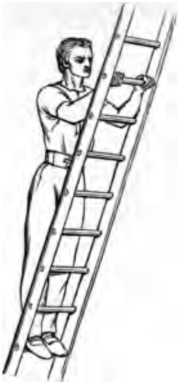
Position of attention, at the foot of the ladder, the toes touching it.

Right hand leading.

EXERCISE I.
COURSE I.

1. Raise the right hand and grasp the spar nearest the reach, the left following, the fingers and thumbs together; lift the right foot from the ground, and place it on the first spar, the left following, resting on the front of the foot, the toes pointed to the front, the column of the body and lower limbs straight but unconstrained, and inclined in the line of the ladder, the head erect, the eyes directed to the reach of the hands (Fig. 1).

Fig. 1.



2. Raise the right hand to the next spar, the left following, lift the right foot to the next spar, straighten the right knee, and lift the left foot to the next spar. Repeat.

In descending, slip the right foot down to the next spar, the left following, slip the right hand down to the next spar, the left following. Repeat.

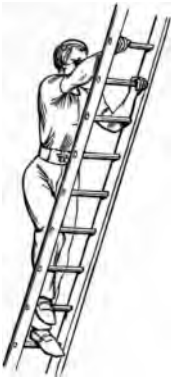
This exercise to be repeated with the left hand leading.

This exercise to be repeated with the hands lightly grasping the sides of the ladder.

Right side leading.

EXERCISE 2. COURSE I. 1. Come to the position on the ladder, as in the previous exercise (Fig. 1).

Fig. 2.



2. Raise the right hand to the next spar, and at the same time lift the right foot to the next spar (Fig. 2); straighten the right knee and lift the left hand and left foot together to the same spar. Repeat.

In descending, slip the right hand down to the next spar, and at the same time slip the right foot down to the next spar, the left hand and left foot following. Repeat.

This exercise to be repeated with the left side leading.

This exercise to be repeated with the hands lightly grasping the sides of the ladder.

Right and left side.

EXERCISE 3. COURSE I. 1. Come to the position on the ladder, as previously.

2. Raise the right hand to the next spar, and at the same time lift the right foot to the next spar, as in Fig. 2; straighten the right knee, and at the same time raise the left hand to the spar above that grasped by the right, and lift the left foot to the spar above that occupied by the right. Repeat the step, the leading hand and foot

always passing the spars occupied by the supporting hand and foot.

In descending, pass the leading hand down to the spar below that grasped by the supporting hand, and the leading foot to the spar below that occupied by the supporting foot. Repeat.

This exercise to be repeated with the hands lightly grasping the sides of the ladder.

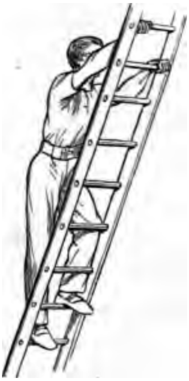
Right and left, hand and foot.

EXERCISE 4. COURSE I. 1. Come to the position on the ladder, as previously.

2. Raise the right hand to the next spar, and at the same time lift the left foot to the next spar (Fig. 3); straighten the left knee, and at the same time raise the left hand to the spar above that grasped by the right, and lift the right foot to the spar above that occupied by the left. Repeat the step, the leading hand and foot always passing the spars occupied by the supporting hand and foot.

In descending, pass the leading hand to the spar below that grasped by the supporting hand, and the leading foot to the spar below that occupied by the supporting foot. Repeat.

Fig. 3.



This exercise to be repeated with the hands lightly grasping the sides of the ladder.

Both hands at once.

EXERCISE 5.
COURSE I.

1. Come to the position on the ladder, as previously.

2. Raise both hands to the next spar; lift the right foot to the next spar, the left following. Repeat.

In descending, slip the right foot down to the next spar, the left following; slip both hands down to the next spar. Repeat.

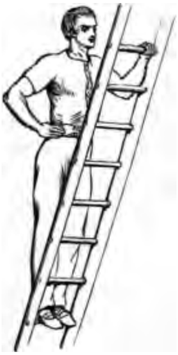
This exercise to be repeated with the hands lightly grasping the sides of the ladder.

With one hand.

EXERCISE 6.
COURSE I.

1. Place the right hand upon the hip joint, the fingers to the front, the thumb to the rear; raise the left hand and grasp the spar nearest the reach (Fig. 4), lift the right foot and place it on the first spar, the left following.

Fig. 4



2. Raise the left hand to the next spar, lift the right foot to the next spar, straighten the right knee, elongate the trunk, and lift the left foot to the same spar. Repeat.

In descending, slip the right foot down to the next spar, the left following, slip the left hand down to the next spar. Repeat.

This exercise to be repeated with the left hand.

This exercise to be repeated with the hand lightly grasping the side of the ladder.

With the feet only.

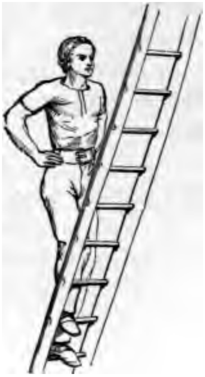
EXERCISE 7.
COURSE III.

1. Place both hands on the hip joint, lift the right foot from the ground and place it on the first spar, the left following, the feet advanced on the spar so that the rest is nearly at the heel, and the front of the leg nearly touching the spars; the column of the body inclined to the front, the head in the same line and the eyes directed to the front.

2. Lift the left foot to the second spar (Fig. 5), straighten the left leg, and at the same time lift the right foot to the same spar. Repeat.

In descending, slip the left foot down to the next spar, the right following. Repeat.

Fig. 5



Second Series.

Position of attention, under the ladder.

Right hand leading.

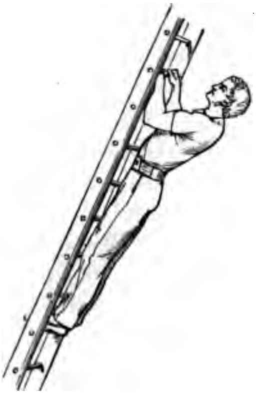
By the spars.

EXERCISE 8.
COURSE I.

1. Raise the right hand and grasp the spar nearest the reach, the left following, the fingers and thumbs together; lift the right foot from the ground and place it on the nearest spar, the left following, straighten the knees, elongate the trunk, the arms bent at the half reach, the chest advanced, the

body inclined in the line of, and close to the ladder, the head back, the eyes directed to the reach of the hands (Fig. 6).

Fig. 6.



2. Raise the right hand to the next spar, the left following; lift the right foot to the next spar, the left following, straighten the knees and elongate the trunk. Repeat.

In descending, slip the right foot down to the next spar, the left following; slip the right hand down to the next spar, the left following. Repeat.

This exercise to be repeated with the left hand leading.

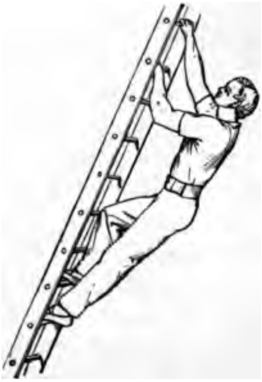
Right side leading.

By the spars.

EXERCISE 9.
COURSE I.

1. Come to the position under the ladder, as in the previous exercise (Fig. 6).

Fig. 7.



2. Raise the right hand to the next spar, and at the same time lift the right foot to the next spar (Fig. 7), the left hand and foot following on the left. Repeat.

In descending, slip the right hand down to the next spar, and at the same time slip the right foot down to the next spar, the left hand and left foot following together to the same spars. Repeat.

This exercise to be repeated with the left side leading.

following, slip the right hand down to the next spar, the left following on the side the same distance. Repeat.

This exercise to be repeated with the left hand leading.

Right side leading.

By spars and sides.

EXERCISE 19. COURSE II.

1. Come to the position under the ladder, grasping spar and side, as in the previous exercise (Fig. 10).

2. Raise the right hand to the next spar, and at the same time lift the right foot to the next spar, the left hand and left foot following the same distance. Repeat.

In descending, slip the right hand down to the next spar, and at the same time slip the right foot down to the next spar, the left hand and left foot following the same distance. Repeat.

This exercise to be repeated with the left side leading.

Right and left side.

By spars and sides.

EXERCISE 20. COURSE II.

1. Come to the position under the ladder, grasping spar and side, as previously.

2. Raise the right hand to the next spar, and at the same time lift the right foot to the next spar; straighten the right knee, and at the same time raise the left hand the distance of the step above the right and the left foot to the spar above that occupied by the right. Repeat the step, the leading hand and foot always passing the supporting hand and foot.

In descending, slip the leading hand and foot down the distance of the step below the supporting hand and foot. Repeat.

hand down to the spar below that grasped by the supporting hand, and the leading foot to the spar below that occupied by the supporting foot. Repeat.

Both hands at once.

By the spars.

EXERCISE 12.
COURSE II.

1. Come to the position under the ladder, as previously.

2. Raise both hands to the next spar, and lift both feet to the next spar, straighten the knees and elongate the trunk. Repeat.

In descending, pass both feet down to the next spar, and pass both hands down to the next spar. Repeat.

Right hand leading.

By the sides.

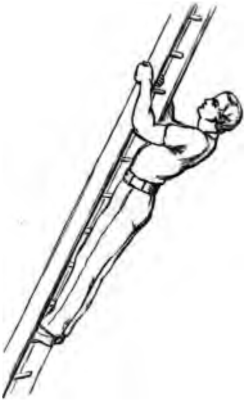
EXERCISE 13.
COURSE II.

1. Come to the position under the ladder, as previously, except that the hands grasp the sides of the ladder, right and left, instead of the spars (Fig. 9).

2. Raise the right hand to the reach, the left following on the left; lift the right foot to the next spar, the left following, straighten the knees and elongate the trunk. Repeat.

In descending, slip the right foot down to the next spar, the left following; slip the right hand down to the rest, the left following on the left. Repeat.

Fig. 9.



This exercise to be repeated with the left hand leading.

Right side leading.

By the sides.

EXERCISE 14.
COURSE II.

1. Come to the position under the ladder, grasping the sides, as in the previous exercise (Fig. 9).

2. Raise the right hand to the reach, and at the same time lift the right foot to the next spar, the left hand and foot following on the left. Repeat.

In descending, slip the right hand down to the rest, and at the same time slip the right foot down to the next spar, the left hand and left foot following on the left. Repeat.

This exercise to be repeated with the left side leading.

Right and left side.

By the sides.

EXERCISE 15.
COURSE II.

1. Come to the position under the ladder, grasping the sides, as previously.

2. Raise the right hand to the reach, and at the same time lift the right foot to the next spar; straighten the right knee, and at the same time raise the left hand to the reach and lift the left foot to the spar above that occupied by the right. Repeat the step, the leading hand and foot always passing the supporting hand and foot.

In descending, pass the leading hand down to the rest, and at the same time slip the leading foot down to the spar below that occupied by the supporting foot. Repeat.

Right and left, hand and foot.

By the sides.

EXERCISE 16.
COURSE II.

1. Come to the position under the ladder, grasping the sides, as previously.

2. Raise the right hand to the reach, and at the same time lift the left foot to the next spar;

straighten the left knee and elongate the trunk, and at the same time raise the left hand to the reach and the right foot to the spar above that occupied by the right. Repeat the step, the leading hand and foot always passing the supporting hand and foot.

In descending, pass the leading hand down to the rest, and at the same time slip the leading foot down to the spar below that occupied by the supporting foot. Repeat.

Both hands at once.

By the sides.

EXERCISE 17.
COURSE III.

1. Come to the position under the ladder, grasping the sides, as previously.

2. Raise both hands to the reach, lift both feet to the next spar, straighten the knees and elongate the trunk. Repeat.

In descending, pass both feet down to the next spar, slip both hands down to the rest. Repeat.

Right hand leading.

By spars and sides.

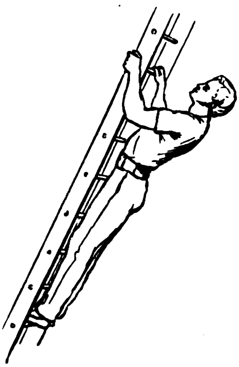
EXERCISE 18.
COURSE II.

1. Come to the position under the ladder, as previously, except that the leading hand grasps the spar, the supporting hand grasps the side of the ladder (Fig. 10).

2. Raise the right hand to the next spar, raise the left hand the same distance on the side; lift the right foot to the next spar, the left following, straighten the knees and elongate the trunk. Repeat.

In descending, slip the right foot down to the next spar, the left

Fig. 10.



following, slip the right hand down to the next spar, the left following on the side the same distance. Repeat.

This exercise to be repeated with the left hand leading.

Right side leading.

By spars and sides.

EXERCISE 19. COURSE II. 1. Come to the position under the ladder, grasping spar and side, as in the previous exercise (Fig. 10).

2. Raise the right hand to the next spar, and at the same time lift the right foot to the next spar, the left hand and left foot following the same distance. Repeat.

In descending, slip the right hand down to the next spar, and at the same time slip the right foot down to the next spar, the left hand and left foot following the same distance. Repeat.

This exercise to be repeated with the left side leading.

Right and left side.

By spars and sides.

EXERCISE 20. COURSE II. 1. Come to the position under the ladder, grasping spar and side, as previously.

2. Raise the right hand to the next spar, and at the same time lift the right foot to the next spar; straighten the right knee, and at the same time raise the left hand the distance of the step above the right and the left foot to the spar above that occupied by the right. Repeat the step, the leading hand and foot always passing the supporting hand and foot.

In descending, slip the leading hand and foot down the distance of the step below the supporting hand and foot. Repeat.

Right and left, hand and foot.

By spars and sides.

EXERCISE 21. COURSE II. 1. Come to the position under the ladder, grasping spar and side, as previously.

2. Raise the right hand to the next spar, and at the same time lift the left foot to the next spar; raise the left hand the distance of the step above the right, and the right foot to the spar above that occupied by the left. Repeat the step, the leading hand and foot always passing the supporting hand and foot.

In descending, slip the leading hand and foot down the distance of the step below the supporting hand and foot. Repeat.

Both hands at once.

By spars and sides.

EXERCISE 22. COURSE III. 1. Come to the position under the ladder, grasping spar and side, as previously.

2. Raise both hands the distance of the step, the right grasping the next spar, the left grasping the side; lift both feet to the next spar, straighten the knees, and elongate the trunk. Repeat.

In descending, slip both hands down the distance of the step, pass both feet down to the next spar. Repeat.

Third Series.

Position of attention above, under, or at the side of the ladder; according as the exercises are above, underneath or sideways.

Right hand leading.

By the sides.

EXERCISE 23. COURSE III. 1. Raise the right hand to the reach and grasp the side of the ladder, the left following on the left, the fingers and thumbs meeting; bend the arms to the half reach, lifting the

2. Raise the left hand to the next spar, raise the right hand to the next spar. Repeat.

In descending, pass the right hand down to the next spar, pass the left hand down to the next spar. Repeat.

This exercise to be repeated with the right hand leading.

Hand over hand.

Sideways.

EXERCISE 33.
COURSE IV.

1. Come to the position sideways, the legs suspended, grasping the spars, as in the previous exercise (Fig. 13).

2. Raise the right hand to the spar above that grasped by the left, elevate the body and raise the left hand to the spar above that grasped by the right. Repeat.

In descending, pass the leading hand down to the spar below that grasped by the supporting hand. Repeat.

Left hand leading.

Sideways. Legs up.

EXERCISE 34.
COURSE III.

1. Come to the position under the ladder, grasping the spars as previously, except that in lifting the feet from the ground they are to be extended to the front horizontally, the legs straight and together, the toes pointed to the front (Fig. 14).

2. Raise the left hand to the next spar, raise the right hand to the next spar. Repeat, retaining the lower limbs in position. Repeat.

In descending, pass the right hand down to the next spar; pass the left hand down to the next spar. Repeat.

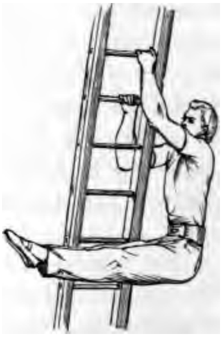


Fig. 14.

This exercise to be repeated with the left hand leading.

arms bent, and the trunk and lower limbs in position. Repeat.

In descending, slip both hands down to the reach. Repeat.

Right hand leading.

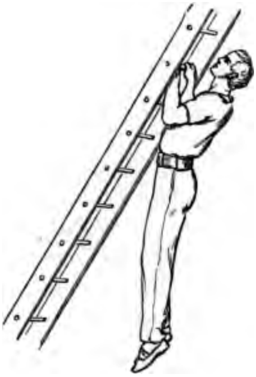
By the spars.

EXERCISE 26.
COURSE III.

1. Raise the right hand and grasp the spar nearest the reach, the left following, the fingers and thumbs together; bend the arms at the half reach, lifting the feet from the ground, the trunk and lower limbs as in twenty-first exercise (Fig. 12).

2. Raise the right hand to the next spar, the left following, bend the arms to the half reach, retaining the trunk and lower limbs in position. Repeat.

Fig. 12.



This exercise to be repeated with the left hand leading.

Hand over hand.

By the spars.

EXERCISE 27.
COURSE III.

1. Come to the position under the ladder, grasping the spars, the legs suspended, as in the previous exercise (Fig. 12).

2. Raise the right hand to the next spar, bend the right arm, and on the instant raise the left hand to the spar above that grasped by the right. Repeat, the leading hand always passing the spar grasped by the supporting hand.

In descending, slip the leading hand down to the spar below that grasped by the supporting hand. Repeat.

Both hands at once.

By the spars.

EXERCISE 28. COURSE IV. 1. Come to the position under the ladder, grasping the spars, the legs suspended, as previously.

2. Shoot up both hands to the next spar, retaining the arms bent, and the trunk and lower limbs in position. Repeat.

In descending, slip both hands down to the next spar. Repeat.

Right hand leading.

By spars and sides.

EXERCISE 29. COURSE III. 1. Come to the position under the ladder, as previously, the legs suspended, the right hand grasping the spar, the left hand grasping the sides of the ladder opposite the right.

2. Raise the right hand to the next spar, the left following the same distance on the side. Repeat.

In descending, slip the right hand down to the next spar, the left following the same distance on the side. Repeat.

This exercise to be repeated with the left hand leading and grasping the spar, the right hand on the side.

Hand over hand.

By spars and sides.

EXERCISE 30. COURSE III. 1. Come to the position under the ladder, the legs suspended, the right hand grasping the ladder, the left the spar, as in the previous exercise.

2. Raise the right hand to the next spar, bend the right arm, and on the instant raise the left hand to the reach beyond the right. Repeat, the leading hand always passing the supporting hand.

In descending, slip the right hand down to the next spar below the left, slip the left down below the right. Repeat.

This exercise to be repeated, the left hand grasping the spar, the right hand on the side.

Both hands at once.

By spars and sides.

EXERCISE 31.
COURSE IV.

1. Come to the position under the ladder, the legs suspended, grasping the side and spar, as previously.

2. Shoot up both hands the distance of the step (the distance between the spars), the right grasping the next spar, the left grasping the side of the ladder opposite the right. Repeat.

In descending, slip both hands down the distance of the step, as in the ascent. Repeat.

This exercise to be repeated, the left hand grasping the spar, the right hand on the side.

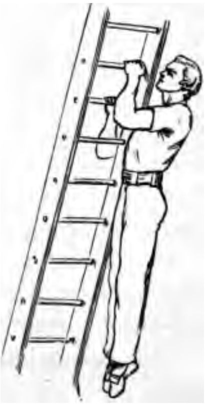
Left hand leading.

Sideways.

EXERCISE 32
COURSE III.

1. Raise the right hand, and passing it above the ladder grasp the spar nearest the reach, the fingers and thumb meeting; raise the left hand, and passing it under the ladder grasp the spar above that grasped by the right; bend the arms and lift both feet from the ground, the legs straight and together, the toes pointed downwards, the trunk of the body upright, the neck free, the head slightly held back, the eyes directed to the reach of the hands (Fig. 13).

Fig. 13.



The first division should have a series of holes cut through the boarding, 15 inches apart in width and 9 inches apart in height. The second should have projecting blocks screwed on the boarding and arranged at the same distances apart as the holes. The third should have 1½ inch boards 11 inches wide screwed on the face boarding, with a space of 1½ inch between the boards, thus forming grooves. This division should not be less than 6 feet in length, and may be as much longer as is convenient, giving facilities for several men ascending together keeping step and time.

First Series . . *With hands and feet.*
Second Series . *With hands only.*

First Series.

Position of attention facing the wall, the toes touching it.

Right hand leading.

EXERCISE I.
COURSE I.

1. Raise the right hand and grasp the ledge of the groove nearest the reach, the left following at the distance to the same groove; lift the right foot from the ground and rest the point of the foot in the first groove, the left following to the same groove, the *toes* slightly turned *outwards*; straighten the knees and elongate the trunk

Fig. 1.

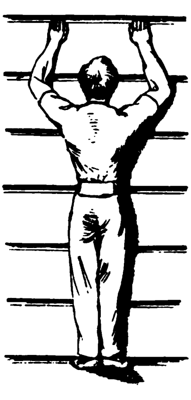
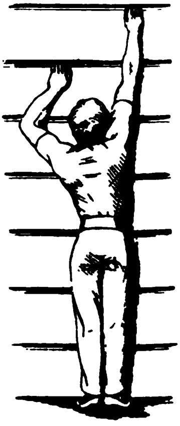


Fig. 2.



Hand over hand.

Sideways. Legs up.

EXERCISE 35.
COURSE IV.

1. Come to the position under the ladder, grasping the spars, the legs up, as in the previous exercise (Fig. 14).

2. Raise the right hand to the spar above that grasped by the left, elevate the body and raise the left hand to the spar above that grasped by the right. Repeat.

In descending, pass the leading hand down to the spar below that grasped by the supporting hand. Repeat.

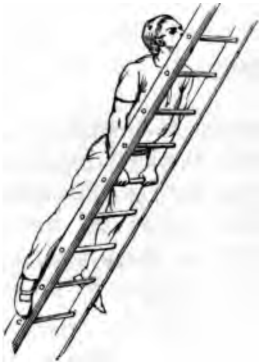
Left hand leading.

Above the ladder.

EXERCISE 36.
COURSE IV.

1. Raise both hands and grasp the spar nearest the reach, the fingers and thumb meeting; press strongly from the hands, and straightening the arms lift both feet from the ground and pass them right and left outside the ladder, the inside of the foot lightly pressing against the supports, the legs straight, the toes pointed downwards, the chest advanced, the head slightly bent back (Fig. 15).

Fig. 15.



2. Raise the right hand to the next spar, straighten the right arm, raise the left hand to the same spar. Repeat.

In descending, slip the right hand down to the next spar, the left following. Repeat.

This exercise to be repeated with the left hand leading.

Hand over hand.

Above the ladder.

EXERCISE 37.
COURSE IV.

1. Come to the position above the ladder, the legs suspended, as in the previous exercise (Fig. 15).

2. Raise the right hand to the next spar, straighten the right arm, and on the instant raise the left hand to the spar above that grasped by the right. Repeat the step, the leading hand always passing the spar grasped by the supporting hand.

In descending, slip the leading hand down to the spar below that grasped by the supporting hand. Repeat.

The first five exercises of the second series and the first three exercises of the third series may be executed with the hands reversed.

To descend rapidly.

Above the ladder.

Pass the right leg over the side of the ladder, the knee bent, the foreleg pendent, the left leg following on the left. Pass the right hand to the outside of the ladder, grasping the support on the underside, the fingers and thumb together, the left hand following on the left. Regulate the rate of descent by the pressure of the hands.

THE PREPARED WALL.

THIS is in reality but one machine, although its triple form, and the varying difficulty of performing the same exercises on the different compartments, might justify its being given as three separate machines. The first has a series of holes in the boarded face of the wall arranged at regular intervals, into which the hand and foot may be inserted, and of sufficient depth to yield a full grasp to the hand and complete rest to the foot; the second has a series of projecting blocks, similarly arranged, yielding only partial grasp to the hand and rest to the foot; and the third has a series of shallow grooves. affording a still more reduced space for the hand and foot. It is this third compartment which has been chosen for describing and illustrating the exercises, but the exercises and their action and position are the same on the other two.

Thus it will be seen that with this machine, not only the exercises themselves regularly rise in difficulty, but its triple form itself gives threefold scope to this progressive variety.

The exercises naturally divide themselves into a first and second series, on the same principle as that which distinguishes the series in the vertical climbing apparatus; the first series comprising those exercises in which both the upper and lower limbs and trunk aid in the ascent; the second, those in which the ascent is accomplished by the action of the upper limbs alone.

The wall should not be less than 12 feet or more than 18 feet high; the face of it being closely boarded.

Second Series.

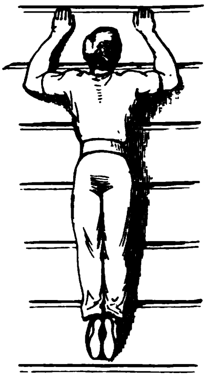
Position of attention facing the wall, the toes touching it.

Right hand leading.

EXERCISE 7.
COURSE III.

1. Raise the right hand and grasp the ledge of the groove nearest the reach, the left following at the distance to the same groove; bend the arms to the half reach of the hands, lifting the feet from the ground, the lower limbs pendent, the toes pointed downwards, the legs straight and together touching the wall, the trunk of the body held firm and upright, the head slightly held back, the eyes directed to the reach of the hands (Fig. 6).

Fig. 6.



2. Raise the right hand to the next groove, the left following to the same groove; bend the arms and raise the body to the half reach of the hands. Repeat.

In descending, slip the right hand down to the next groove, the left following at the distance, retaining the arms bent at the half reach. Repeat.

This exercise to be repeated with the left hand leading.

Right and left.

EXERCISE 8.
COURSE IV.

1. Come to the position on the wall, the legs suspended, as in the previous exercise (Fig. 6).

2. Raise the right hand to the next groove and elevate the body to the rest of the left hand, and on the instant

to the half reach of the hands, the whole column of the body held firm and upright, the legs together, the loins and hips pressed inwards, the chest advanced and held close to the wall, the shoulders flat, the head slightly held back, the eyes directed to the reach of the hands (Fig. 1).

2. Raise the right hand to the next groove (Fig. 2), the left following at the distance; raise the right foot and rest it in the second groove, the left following; straighten the knees and elongate the trunk. Repeat.

In descending, slip the right foot down to the next groove, the left following; slip the right hand down to the next groove, the left following. Repeat.

This exercise to be repeated with the left hand leading.

The right side leading.

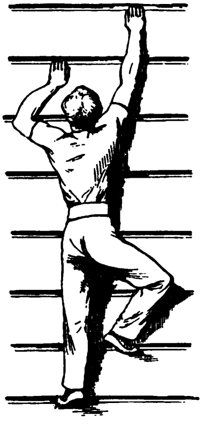
EXERCISE 2.
COURSE I.

1. Come to the position on the wall, as in the previous exercise (Fig. 1).

2. Raise the right hand to the next groove, and at the same time lift the right foot to the next groove (Fig. 3), the left hand and left foot following together the same distance; straighten the knees and elongate the trunk. Repeat.

In descending, slip the right hand down to the next groove, and at the same time slip the right foot down to the next groove, the left hand and left foot following together the same distance. Repeat.

Fig. 3.



This exercise to be repeated with the left side leading.

Right and left side.

EXERCISE 3.
COURSE I.

1. Come to the position on the wall, as previously.

2. Raise the right hand to the next groove, and at the same time lift the right foot to the next groove, as in Fig. 3; straighten the right knee, bend the right arm, and elongate the trunk, and at the same time raise the left hand to the groove above that occupied by the right, and lift the left foot to the groove above that occupied by the right. Repeat the step, the leading hand and foot always passing the grooves occupied by the supporting hand and foot.

In descending, slip the leading hand down to the groove below that occupied by the supporting hand, and the leading foot to the groove below that occupied by the supporting foot. Repeat.

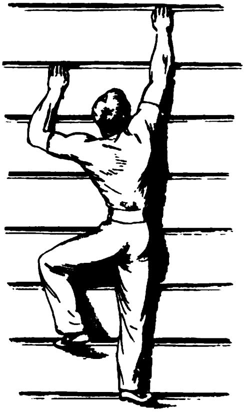
Right and left, hand and foot.

EXERCISE 4.
COURSE I.

1. Come to the position on the wall, as previously.

2. Raise the right hand to the next groove, and at the same time lift the left foot to the next groove (Fig. 4); straighten the left knee, bend the right arm, and elongate the trunk, and at the same time raise the left hand to the groove above that occupied by the right, and lift the right foot to the groove above that occupied by the left. Repeat the step, the leading hand and foot always passing the grooves occupied by the supporting hand and foot.

Fig. 4.



In descending, slip the leading hand down to the groove below that occupied by the supporting hand, and at the same time slip the leading foot down to the groove below that occupied by the supporting foot. Repeat.

Both hands at once.

EXERCISE 5.
COURSE II.

1. Come to the position on the wall, as previously.

2. Shoot up both hands to the next groove; lift both feet, without bending the arms, and rest them in the next groove; straighten the knees and elongate the trunk. Repeat.

In descending, slip both feet down to the next groove, retaining the lower limbs in position; slip both hands down to the next groove. Repeat.

With one hand.

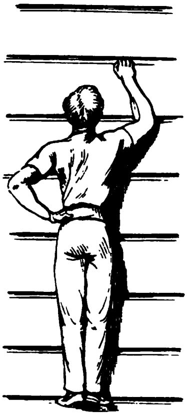
EXERCISE 6.
COURSE III.

1. Place the left hand on the hip joint, the thumb to the rear, the fingers to the front; raise the right hand to the groove nearest the reach, lift the left foot to the first groove, the right following; straighten the knees and elongate the trunk to the half reach of the right hand (Fig. 5).

2. Press the body close in to the wall and instantly raise the right hand to the next groove, lift the left foot to the next groove, the right following, straighten the knees and elongate the trunk. Repeat.

In descending, slip the left foot down to the next groove, the right following; slip the right hand down to the next groove. Repeat.

Fig. 5.



This exercise to be repeated with the left hand.

Second Series.

Position of attention facing the wall, the toes touching it.

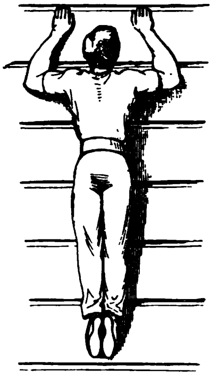
Right hand leading.

EXERCISE 7.
COURSE III.

1. Raise the right hand and grasp the ledge of the groove nearest the reach, the left following at the distance to the same groove; bend the arms to the half reach of the hands, lifting the feet from the ground, the lower limbs pendent, the toes pointed downwards, the legs straight and together touching the wall, the trunk of the body held firm and upright, the head slightly held back, the eyes directed to the reach of the hands (Fig. 6).

2. Raise the right hand to the next groove, the left following to the same groove; bend the arms and raise the body to the half reach of the hands. Repeat.

Fig. 6.



In descending, slip the right hand down to the next groove, the left following at the distance, retaining the arms bent at the half reach. Repeat.

This exercise to be repeated with the left hand leading.

Right and left.

EXERCISE 8.
COURSE IV.

1. Come to the position on the wall, the legs suspended, as in the previous exercise (Fig. 6).

2. Raise the right hand to the next groove and elevate the body to the rest of the left hand, and on the instant

raise the left hand to the groove above that occupied by the right. Repeat, the leading hand always passing the groove occupied by the supporting hand.

In descending, slip the leading hand down to the groove below that occupied by the supporting hand. Repeat.

Both hands at once.

EXERCISE 9.
COURSE IV.

1. Raise both hands to the groove nearest the reach, bend the arms to the half reach, and come to the position, the legs suspended as previously.

2. Shoot up both hands to the next groove, bend the arms, and elevate the body to the rest of the hands. Repeat.

At the last step rest both feet on the nearest groove, and descend by slipping both feet down to the next groove, retaining the lower limbs in position; slip both hands down to the nearest groove. Repeat.

CLIMBING.

An upright object presents itself as the most perfect form of machine to be ascended by climbing, and the hands are the chief agent in affecting the ascent, for they not only aid in the execution of every exercise, simple or difficult, in which the feet take a share, but there is a large series embracing the most difficult and artistic exercises, in which the body is sustained and elevated by the hands alone.

Following out this idea, a perfectly vertical object, of girth capable of being grasped by the hand, may be viewed as the typical machine for climbing. But this simple description of machine instantly takes a dual form from the nature of the material of which it is constructed; it is either hard and firm, like the wooden pole affording unyielding fulcra to the muscles of the hands in their grasp, and to those of the feet in their clasp, or it is soft and pliable like the hempen rope, the characteristics of which are the reverse of these.

We have thus at the very outset two machines, giving origin to the two divisions of machines employed in this section, the one being the single upright pole, fixed or suspended, and the other, its companion machine, the single rope similarly placed; and all deviations from these two, either in dimensions, number, or position, are but modifications of them, designed for special purposes.

Where the single pole is retained, and its dimensions only are altered, every gradation of size may be obtained until the girth of the mast is reached, the exercises being modified or changed with the alteration in the dimensions of the machine. Where the single pole is retained, and its position changed for the inclined one, the exercises again change, taking a range both wide and varied; and when the pole, from being fixed, is made to turn on its axis, again the exercises, in action and position, in nature and purpose, change also.

The first division, springing from the slender, upright pole, branches first into the pair of poles, arranged in such a position as to present one to each hand about the width of the shoulders apart, the body to be sustained between the two, and from this arrangement springs an arduous series of exercises; next, into those poles which, being inclined, present a long series of simple exercises, the altered position of the poles altering the entire character o the exercises to be executed upon them.

The second branch, springing from the single vertical rope, also takes a very extended form. A double rope is not accepted, as yielding no exercise sufficiently removed from those on the pair of poles to justify its adoption as a separate machine. A wider range of exercises, in which the lower limbs also are employed, is afforded by the rope than by the pole, and those in which the hands alone sustain and elevate the body are all a degree harder than the corresponding ones on its companion machine. The single rope may be simple or knotted, the knots being formed in the rope itself, or superadded; and every change will to some extent enlarge the range of the exercises, qualify their difficulty, and vary the parts of the body required for their execution.

In all forms of climbing the position varies but little with regard to the trunk of the body, because it is determined by principles which are equally important in every exercise, viz. to set the limbs free from the due execution of the movements of the step, to preserve the equilibrium, and to give full scope to respiration; but with regard to the limbs, it is varied in every exercise on each machine.

In the initiatory practice, the instructor should count the time for the learner—one, two, three,—for the three separate movements of the step, at a pace proportionate to his ability, taking care that each step is of the same length, and executed at the same speed as the others; perfect cadence and rhythm should accompany the whole of each exercise, both in the ascent and descent.

The initiatory practice should consist of brief efforts, and the instructor should give the 'halt' on the slightest indication of exhaustion or insecurity of grasp; a pause, less or more protracted, should always follow the halt, and as much care should be given to the descent as to the ascent; the last step should be as carefully completed as any in the exercise, the feet should be set leisurely upon the ground, and the grasp of the hands quietly relinquished, the movement being closed in the original position of 'attention,' and place immediately given to another climber.

The instructor should also carefully impress upon the learner the desirability of executing every exercise quietly and steadily, of keeping the countenance quiet even under the most severe efforts, and of never, on any occasion, speaking while executing an exercise himself, or of addressing any one else who is doing so.

THE VERTICAL POLE.

It is characteristic of simple climbing, i.e. that form of climbing in which all the resources of the body capable of aiding in the ascent are called into action, that the upper and lower limbs and trunk all receive a fair share of well-distributed employment. The first series gives the same employment in every exercise to the lower half of the body, with a different mode of employment to the upper, in each separate one. In the first exercise (which is considered the easiest mode of ascent, because neither hand is ever separated for a moment from the pole, while both are acting during the elevation of the body which completes each step), one side of the body leads throughout the ascent, and the other throughout the descent. In an elementary sense this feature can be turned to great advantage if one side of the body be weaker than the other, by giving that side the lead, and consequently the largest share of employment; in a practical sense by making the strongest and most dexterous member the leading one, and consequently the chief agent in the ascent. In the next form, where the action is alternated right and left, the equalization of the body is preserved on the same principle as in certain exercises in the preceding section, from the fact that both sides are separately, and each for itself and by itself, doing the same amount of work, and therefore the weaker side, being the weaker, is virtually doing more—is being urged to greater activity, reaping a proportionately greater advantage. Here each hand, during its elevation, entirely quits the pole, and the body is raised on the elevation of each. In the fourth exercise both hands act together, both in the ascent and descent, thus both quitting the pole at the same instant.

In all these exercises the column of the body is maintained in the position most favourable to free respiration.

The instructor should take care that the learner places his hands and feet in their proper order and position in commencing each exercise: the leading arm should be completely extended to the reach at each step, and the arms must not be bent when the feet are lifted, but only when the elongation of the legs and trunk renders it necessary in the third movement of the step. Beginners frequently try to struggle up the machine by means of the hands only, the instructor should therefore carefully explain to them how one part of the body assists the other in making the ascent, and how, upon the correct employment of these various parts, the facility and elegance of climbing depend. When the feet are lifted in the second movement, the upper part of the body must not be allowed to incline backwards, but the back must be bent outwards.

In the third movement, the legs and trunk must be straightened without jerk, and the whole body be kept as close to the pole as possible. In the descent, the legs and trunk should be kept straight throughout, the body being sustained by the legs during the movements of the hands.

In the second exercise, the upper part of the body must not be allowed to sway too much from side to side, which is apt to result from the separate employment of the hands; and in the descent the moving hand should not be placed until the opposite arm is perfectly extended.

The second series of exercises on this machine is of a much more arduous character than the first. In the former the upper limbs take up and repeat the action of the latter, but they are entirely unaided by the lower limbs and trunk, and in some exercises the position of these is chosen for its value in an elementary sense, its object being to heighten the difficulty of the exercise, and to intensify the action of the upper part of the body, by acting strongly against it.

In the first exercise of this series, the lower half of the body is merely held quiescent, and in the position most favourable to the ascent; in the second, it is held formally in the line of the machine; and in the third, the same formality of position is preserved with the lower half, while the upper is employed in rapid action, elevating the whole.

The elementary value of this second series is very great, developing powerfully not only the muscular energies of the arms and upper portion of the trunk, but the tenacity and security of the grip of the hands, and the facility and readiness of action of the upper limbs, either in separate or combined effort.

In performing the exercises the learner must be instructed not to allow the left side to sway round to the left side of the pole; but the hands must ascend and descend in a straight line, and the same side of the pole be retained throughout. In the second exercise, beginners are very apt to make a more complete step with the left hand than with the right, because they are better able to support themselves with the right while the left moves, and for the same reason to allow the left arm to relax while the right moves, so that special attention is required to ensure an equal step with each hand. In the fourth exercise the body must not be allowed to recede as the hands are moved, and the movement of these must therefore take place before the flexion of the arms is quite complete.

In the last exercise a strong pressure of the feet will be required to prevent the body from receding as the hand is raised to the reach, and the upper part of the body must be kept as close as possible to the pole throughout.

During the first few steps, the position of the instructor should be where he can best observe the movements of the climber; afterwards, his position should be behind the climber on the left, that he may be able to interpose his right hand in the event of a slip.

The vertical pole may be of any height from 15 feet to 30 feet, and there should be in a gymnasium three or four of different diameter, viz. 2 inches, 2½ inches, and 3 inches.

FIRST SERIES . . . *With hands and feet.*
SECOND SERIES . . . *With hands only.*

First Series.

Position of attention facing the pole.

Right hand leading.

EXERCISE I. COURSE I. 1. Raise the right hand to the reach and grasp the pole, the left following (Fig. 1); lift the right foot from the ground and place it against the left side of the pole, the knee on the right side (Fig. 2); lift the left foot and place it in front of the pole, the ankles crossing, the outside edges of the feet together, the pole between them (Fig. 3); straighten the legs and elongate the trunk; the whole column of the body upright, the chest advanced, the shoulders flat, the elbows in by the sides, the hands at the half reach, the neck free, the head slightly held back, the chin elevated, the eyes directed to the reach of the hands (Fig. 4).

2. Raise the right hand to the reach and grasp the pole, the left following; draw up the lower limbs without relinquishing their clasp of the pole, allowing it, as it were, merely to slip between, and without bending the arms, as in Fig. 3; tighten the clasp of the feet when elevated, straighten the knees, and elongate the trunk to the rest of the hands, as in Fig. 4. Repeat.

Fig. 1.

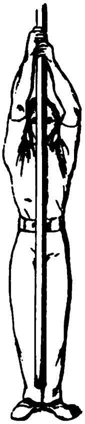


Fig. 2.

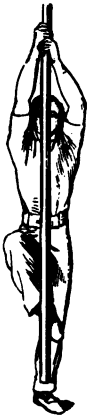


Fig. 3.

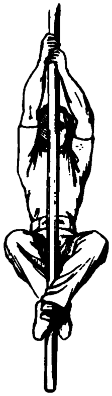
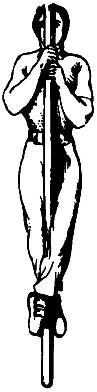


Fig. 4



In descending, slip the left hand down opposite the breast and grasp the pole, the right following; slacken the clasp of the lower limbs, lower the body to the reach of the hands, retaining the legs straight and the pole between them. Repeat.

This exercise to be repeated with the left hand leading. the relative positions of the feet reversed.

Hand over hand.

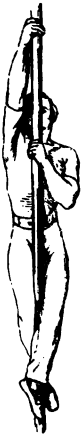
EXERCISE 2.
COURSE I.

1. Grasp the pole, raise the legs, and come to the position as in the previous exercise (Fig. 3).

2. Raise the right hand to the reach and grasp the pole (Fig. 5), draw up the lower limbs without bending the right arm, straighten the legs, and elongate the trunk to the rest of the right arm. Repeat, raising the left hand to the reach, the right and left hand alternating throughout.

In descending, slip the leading hand down opposite the breast and grasp the pole, lower the body to the reach of the supporting hand, the legs straight and the pole between them. Repeat.

Fig. 5.



Hand over hand.

A Second Method.

EXERCISE 3.
COURSE I.

1. Come to the position on the pole (Fig. 3), as previously.

2. Raise the left hand to the half reach above the right, and raise the right to the reach above the left, draw up the lower limbs, straighten the legs, and elongate the trunk. Repeat.

Descend as in the previous exercise.

Both hands at once.

EXERCISE 4.
COURSE II.

1. **Raise** both hands to the reach and grasp the pole; lift both feet from the ground and clasp the pole, the ankles crossing, as previously, bringing the hands to the half reach as in Fig. 4, the rest of the body in position.

2. Shoot up both hands to the reach, draw up the lower limbs without bending the arms, straighten the knees and elongate the trunk. Repeat.

In descending, slip both hands down opposite the breast and grasp the pole, lower the body to the reach of the hands. Repeat.

With one hand.

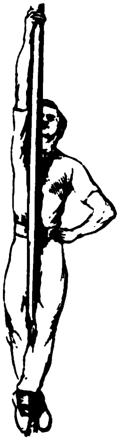
EXERCISE 5.
COURSE III.

1. Raise the right hand to the reach and grasp the pole; spring from the ground and clasp the pole with the feet as in first exercise, bringing the right hand to the half reach; place the left hand on the hip joint, the fingers to the front, the thumb to the rear, the rest of the body in position.

2. Tighten the clasp of the feet, raise the right hand to the reach (Fig. 6), draw up the lower limbs without bending the arm, straighten the knees and elongate the trunk. Repeat.

In descending, slip the right hand down opposite the breast, lower the body to the half reach of the hand. Repeat.

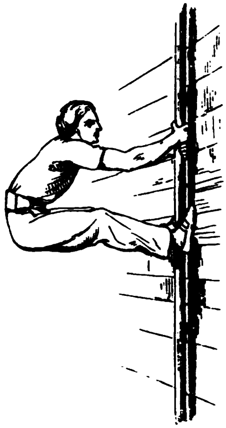
Fig. 6.



This exercise to be repeated with the left hand.

the wall as high as the hip, on the right side of, and close to, the pole, the left following on the left (Fig. 1).

Fig. 1.



2. Slightly incline the body to the left front, raise the right hand to the reach, incline the body to the right front, raise the left hand to the reach, grasp strongly with both hands, lift the right foot the distance of the step, the left following on the left. Repeat.

In descending, slip the left foot down the distance of the step, the right following; slip the left hand down opposite the breast, the right following. Repeat.

This exercise to be repeated with the left hand leading.

Right side leading.

EXERCISE 2.
COURSE III.

1. Grasp the pole, raise the legs and place the feet on the wall, as in the previous exercise (Fig. 1).

2. Slightly incline the body to the left front, raise the right hand to the reach and at the same time lift the right foot the distance of the step, the left hand and left foot following together the same distance. Repeat.

In descending, slightly incline the body to the left front, slip the right hand down opposite the breast, and at the same time slip the right foot down the same distance. Repeat.

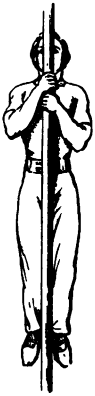
This exercise to be repeated with the left side leading.

Hand over hand.

EXERCISE 7.
COURSE III.

1. Raise the right hand to the reach and grasp the pole, the left following; lift both feet from the ground, raising the body until the hands are at the half reach; the legs straight and together, the toes pointed downwards, and slightly turned out (the pole lying free between them), the column of the body perfectly upright and in the line of the pole, the head erect, the eyes directed to the reach of the hands (Fig. 9).

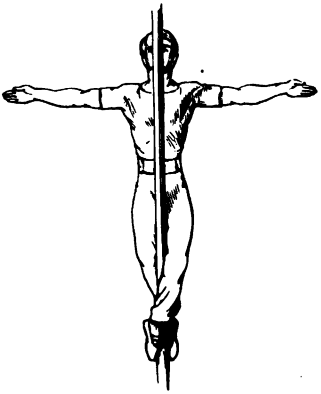
Fig. 9.



2. Raise the right hand to the reach, elevating the body to the rest of the left; raise the left hand to the reach, elevating the body to the rest of the right. Repeat. At the last step clasp the pole with the feet, the ankles crossing.

In descending, remove the hands from the pole and extend the arms horizontally to the side, right and left, the fingers together, the palms to the front (Fig. 10). Guide the descent by the pressure of the lower limbs.

Fig. 10.



Both hands at once.

EXERCISE 8.
COURSE IV.

1. Raise both hands to the reach and grasp the pole, the legs suspended on the side of the pole (Fig. 7).

2. Shoot up both hands to the reach and gras
pole, elevate the body to the half reach of the
Repeat.

In descending, slip both hands down opposite the
and grasp the pole, lower the body to the half reach
hands. Repeat.

THE VERTICAL POLE.

(Fixed close to a wall.)

THE difficulty of the exercises on this machine in this position is almost solely owing to its position against a wall, whereby the freedom of the hand-grasp and the clasp of the lower limbs are entirely lost. All its exercises are of an arduous description, and can only be accomplished after the hand and forearm have been strengthened by similar but less difficult exercises.

This machine is a pole, 3 inches in diameter, fixed within 1½ inch of the face of a wall by means of small wooden blocks at intervals behind it. It may be fixed on part of the front of the Prepared Wall.

FIRST SERIES . . .	*Hands and feet.*
SECOND SERIES . . .	*Hands and knees.*

First Series.

Position of attention facing the wall, the toes touching it.

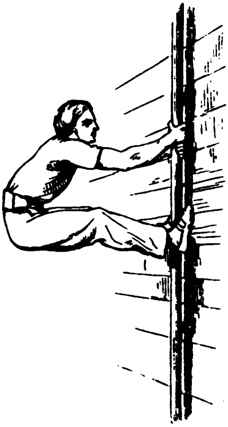
Right hand leading.

EXERCISE I.
COURSE III.

1. Raise the right hand to the reach and grasp the pole, the fingers and thumb meeting, the left following close under it; lift the right foot from the ground and place it flat upon

the wall as high as the hip, on the right side of, and close to, the pole, the left following on the left (Fig. 1).

Fig. 1.



2. Slightly incline the body to the left front, raise the right hand to the reach, incline the body to the right front, raise the left hand to the reach, grasp strongly with both hands, lift the right foot the distance of the step, the left following on the left. Repeat.

In descending, slip the left foot down the distance of the step, the right following; slip the left hand down opposite the breast, the right following. Repeat.

This exercise to be repeated with the left hand leading.

Right side leading.

EXERCISE 2.
COURSE III.

1. Grasp the pole, raise the legs and place the feet on the wall, as in the previous exercise (Fig. 1).

2. Slightly incline the body to the left front, raise the right hand to the reach and at the same time lift the right foot the distance of the step, the left hand and left foot following together the same distance. Repeat.

In descending, slightly incline the body to the left front, slip the right hand down opposite the breast, and at the same time slip the right foot down the same distance. Repeat.

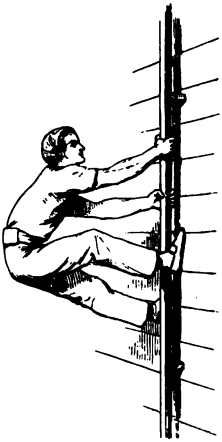
This exercise to be repeated with the left side leading.

Right and left side.

EXERCISE 3.
COURSE III.

1. Come to the position on the pole, the feet on the wall, as previously.

Fig. 2.



2. Slightly incline the body to the left front, raise the right hand to the reach, and at the same time lift the right foot the distance of the step (Fig. 2); incline the body to the right front, raise the left hand to the reach above the right, and at the same time lift the left foot the distance of the step beyond the right. Repeat.

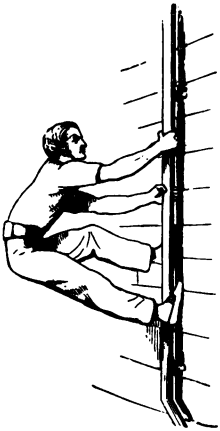
In descending, incline the body to the supporting side, pass the leading hand down opposite the breast, and at the same time slip the leading foot down the distance of the step. Repeat.

Right and left, hand and foot.

EXERCISE 4.
COURSE III.

1. Come to the position on the pole, the feet on the wall, as previously.

Fig. 3.



2. Raise the right hand to the reach, and at the same time lift the left foot the distance of the step (Fig. 3); raise the left hand to the reach, and at the same time lift the right foot the distance of the step. Repeat.

In descending, pass the leading hand down opposite the breast, and at the same time slip the leading foot down the distance of the step. Repeat.

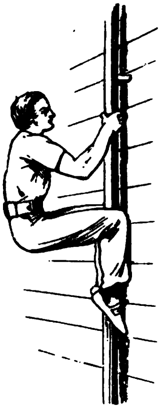
Second Series.

Position of attention facing the wall, the toes touching it.

Right hand leading.

EXERCISE 5. COURSE III. 1. Raise the right hand to the reach and grasp the pole, the left following close under it; spring from the ground and bring both knees against the wall, as high as the waist, one on each side of the pole, touching it (Fig. 4).

Fig. 4.



2. Raise the right hand to the reach, the left following, grasp strongly with the hands and spring upwards from both knees. Repeat.

In descending, slip the left hand down opposite the breast, the right following, grasp strongly and slip both knees down the distance of the step. Repeat.

This exercise to be repeated with the left hand leading.

Right side leading.

EXERCISE 6. COURSE III. 1. Come to the position on the pole, the knees against the wall, as in the previous exercise (Fig. 4).

2. Raise the right hand to the reach, and at the same time lift the right knee the distance of the step, the left hand and left knee following the same distance. Repeat.

In descending, slip the right hand down opposite the breast, and at the same time slip the right knee down the same distance, the left hand and knee following together on the left. Repeat.

This exercise to be repeated with the left side leading.

Right and left side.

EXERCISE 7.
COURSE IV.

1. Come to the position on the pole, the knees against the wall, as previously.

2. Raise the right hand and knee, as in preceding exercise; raise the left hand and left knee the distance of the step beyond the right hand and right knee. Repeat, the leading hand and knee always passing the supporting hand and knee.

In descending, pass the leading hand down opposite the breast, and at the same time slip the leading knee down the distance of the step. Repeat.

Right and left, hand and knee.

EXERCISE 8.
COURSE IV.

1. Come to the position, the knees against the wall, as previously.

2. Raise the right hand to the reach, and at the same time lift the left knee the distance of the step; raise the left hand to the reach, and at the same time lift the right knee the distance of the step. Repeat.

In descending, pass the leading hand down opposite the breast, and at the same time slip the leading knees down the distance of the step. Repeat.

Both hands at once.

EXERCISE 9.
COURSE IV.

1. Come to the position, the knees against the wall, as previously.

2. Raise both hands to the reach, grasp the pole strongly, and spring upward with both knees the distance of the step. Repeat.

In descending, slip both hands down opposite the breast, grasp the pole strongly, and slip both knees down the distance of the step. Repeat.

THE SLANTING POLE.

THE first series of exercises on this machine, *under the pole,* are substantially the same as the corresponding series on the vertical pole, with this difference, that their difficulty is much reduced by its inclined position. The hands still follow the same modes of action as on the vertical machine, but with less difficulty, and the lower limbs bear altogether a less important part in the step, and consequently receive less benefit from it. This machine may for these reasons be made introductory to the vertical one, when, as will sometimes be the case, the simplest exercises on the latter are found too difficult for the beginner.

The second series, *above the pole,* is also essentially initiatory, but is valuable both in an elementary and practical sense. The exercises comprised in it are safe and interesting, besides giving much light and well distributed movement to both trunk and limbs; as, the reach being made and the lower limbs drawn up, the elongation of the trunk is almost entirely effected by the action of the back and loins.

The exercises in the third series, *under the pole,* are executed entirely by the upper part of the body and the upper limbs, thus corresponding with the second series on the vertical machine, but, as in the series corresponding with the first, they are of a much less arduous nature, owing to the inclined position of the machine.

It will be seen that the first and third series of exercises on this machine entirely correspond with the first and second series on the pole in its vertical position, while every exercise is lessened in difficulty by its inclination; and as this changed position presents another surface, a third and intermediate series is afforded of an entirely different character to either, in which the column of the body is supported on the pole itself. This machine, therefore, is in all respects a valuable companion to the vertical one, with all the corresponding exercises slightly reduced in difficulty for the special practice of less able beginners.

The position of the instructor should be under the pole, because all falls from this machine will be under it; except when the climber is learning the movements of the step in the second series, when the instructor should be in front of the pole behind the climber in order to direct his efforts.

The slanting pole should be 3 inches in diameter, and not less than 15 feet or more than 20 feet in length, and laid at an angle of about 45 degrees.

FIRST SERIES . . . *Under the pole.*
SECOND SERIES . . . *Above the pole.*
THIRD SERIES . . . *Hands only.*

First Series.

Position of attention, under the pole.

Left hand leading.

EXERCISE I. COURSE I. 1. Advance the left hand to the reach and grasp the pole, the right following; lift the left foot from the ground and place it against the right side of the pole underneath, the knee to the left; lift the right foot and place the heel over the pole, the ankles crossing, the outside edges of the feet together, the pole between them (Fig. 1), straighten the legs and elongate the trunk, the column of the body at the incline of the pole, the head slightly held back, the eyes directed to the reach of the hands (Fig. 2).

2. Advance the left hand to the reach (Fig. 3), the right following, draw up the lower limbs without bending the arms, as in Fig. 1, straighten the legs and elongate the trunk to the rest of the hands. Repeat.

Fig. 1.

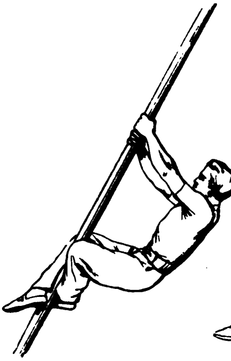


Fig. 2.

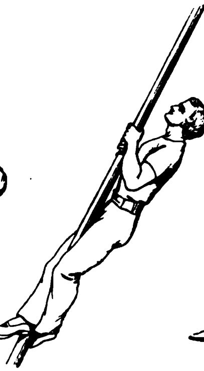
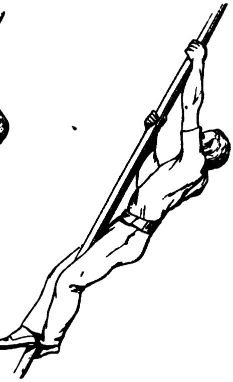


Fig. 3.



In descending, slip the right hand down opposite to the breast, the left following, and lower the body to the reach of the hands. Repeat.

This exercise to be repeated with the right hand leading.

Hand over hand.

EXERCISE 2.
COURSE I.

1. Grasp the pole, raise the legs and come to the position, the ankles crossing, as in the previous exercise (Fig. 1).

2. Advance the left hand to the reach, as in Fig. 3, draw up the lower limbs without bending the arms, straighten the knees and elongate the trunk to the rest of the right

hand. Repeat, raising the right hand to the reach, the right and left hand alternating throughout.

In descending, slip the leading hand down opposite to the breast, lower the body to the reach of the supporting hand. Repeat.

Both hands at once.

EXERCISE 3.
COURSE II.

1. Advance both hands to the reach and grasp the pole; lift both feet from the ground and clasp the pole, the ankles crossing, as previously. The rest of the body in position as in Fig. 2.

2. Shoot up both hands to the reach, draw up the lower limbs without bending the arms, and elongate the trunk to the rest of the hands. Repeat.

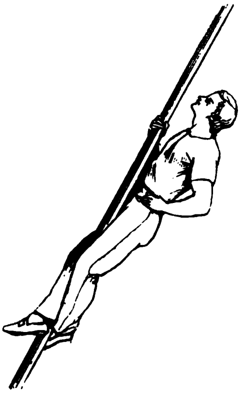
With one hand.

EXERCISE 4.
COURSE III.

1. Advance the right hand to the reach and grasp the pole, spring from the ground and clasp the pole with the feet as before, bringing the right hand to the half reach, and placing the left hand on the hip joint, the fingers to the front, the thumb to the rear, the rest of the body in position (Fig. 4).

2. Tighten the clasp of the feet, raise the right hand to the reach, draw up the lower limbs, straighten the knees and elongate the trunk. Repeat.

Fig. 4.



In descending, slip the right hand down opposite the breast, lower the body to the half reach of the hand. Repeat.

This exercise to be repeated with the left hand.

Second Series.

Position of attention facing the pole, the toes touching it.

Left hand leading.

EXERCISE 5.
COURSE I.

1. Stoop forward and grasp the pole with the left hand, the right following immediately under it, slowly extend the trunk of the body along its surface; lift the left foot from the ground and place it against the right side of the pole, the knee on the left; lift the right foot from the ground and place it under the pole, clasping it with the back of the ankle, the trunk of the body in a straight line along its surface, the head slightly held back, the eyes directed to the reach of the hands (Fig. 5), straighten the legs and elongate the trunk (Fig. 6).

Fig. 5.

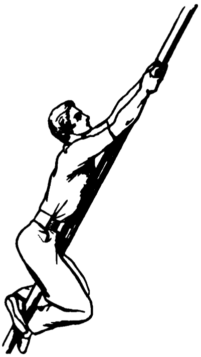


Fig. 6.

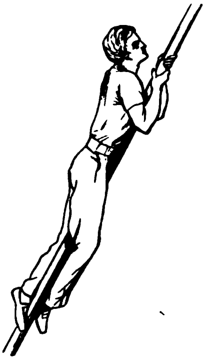
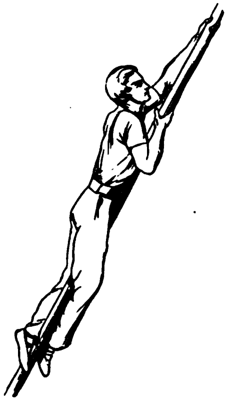


Fig. 7.



2. Advance the left hand to the reach (Fig. 7), the right following, draw up the lower limbs without bending the arms, straighten the knees and elongate the trunk to the rest of the hands. Repeat.

In descending, slip the right hand down opposite the breast, the left following, lower the body to the reach of the hands. Repeat.

This exercise to be repeated with the right hand leading.

Hand over hand.

EXERCISE 6.
COURSE I.

1. Come to the position above the pole, the feet clasping it, as in the previous exercise (Fig. 5).

2. Advance the left hand to the reach, as in Fig. 7, draw up the lower limbs, without bending the arm, straighten the knees and elongate the trunk to the rest of the right hand. Repeat, raising the right hand to the reach, the right and left hand alternating throughout.

In descending, slip the leading hand down opposite the breast, lower the body to the reach of the supporting hand. Repeat.

Both hands at once.

EXERCISE 7.
COURSE II.

1. Come to the position above the pole, the feet clasping it, as previously.

2. Shoot up both hands to the reach, draw up the lower limbs without bending the arms, straighten the knees and elongate the trunk to the rest of the hands. Repeat.

In descending, slip both hands down opposite the breast, lower the body to the reach of the hands. Repeat.

Third Series.

Position of attention, under the pole.

Left hand leading.

EXERCISE 8.
COURSE III.

1. Advance the left hand and grasp the pole, the right following; lift both feet from the ground, bringing the hands to the half reach, the legs together and straight, the feet together

with the toes pointed downwards, the chest advanced, the shoulders square to the front, the neck free, the head slightly held back, the eyes directed to the front, the chin elevated (Fig. 8).

Fig. 8.

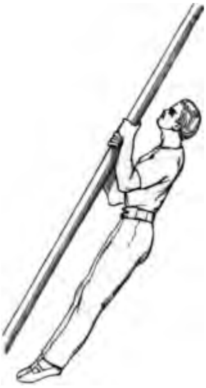
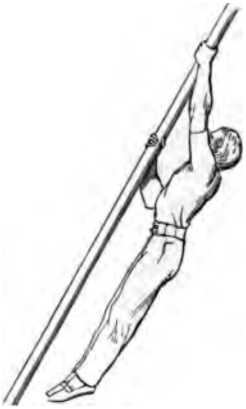


Fig. 9.



2 Advance the left hand to the reach (Fig. 9), the right following, bend the arms until the hands are at the half reach. Repeat.

In descending, slip the right hand down opposite the breast, the left following. Repeat.

This exercise to be repeated with the right hand leading.

Hand over hand.

EXERCISE 9.
COURSE III.

1. Come to the position on the pole, the legs suspended, as in the previous exercise, (Fig. 8).

2. Advance the left hand to the reach, as in Fig. 9, leaving the right at the half reach; bend the left arm until

the hand is at the half reach and raise the right hand to the reach. Repeat.

In descending, slip the leading hand down opposite the breast, leaving the supporting hand at the reach. Repeat.

Both hands at once.

EXERCISE 10.
COURSE IV.

1. Come to the position on the pole, the legs suspended, as previously.

2. Shoot up both hands the distance of the step, but retaining the arms bent at the half reach. Repeat.

In descending, slip both hands down the distance of the step, retaining the arms bent as in the ascent. Repeat.

THE TURNING POLE.

ALL the exercises on this machine are of an essentially elementary character, and especially designed to accomplish two objects; first, to strengthen the hands, wrists, and forearms; second, to cultivate the power of preserving the equilibrium under the greatest difficulties.

No exercise on this machine requires much muscular power, nicety of movement for the preservation of balance being the chief requisite, although all the exercises forming the third series on the preceding machine can be executed here with the same advantages, heightened by the difficulty arising from the tendency of the pole to revolve. It is for this reason that these two machines are found very valuable in the gymnasium, as nothing is so desirable for learners as a wide and varied range of exercises interesting in themselves, and which cultivate dexterity of action, precision and accuracy of movement, and complete command of the trunk and limbs. They are valuable to the more advanced learners, because it is found that those exercises which are almost limited to great muscular effort, or in other words, in which the resistance is at its maximum and the movement at its minimum, are not so conducive to muscular development as where these qualities are fairly balanced.

The position of the instructor should be under the pole, except when directing the climber in the movements of the step, when he should be in front of it.

The turning pole should be similar to the preceding machine and laid at the same angle, but made to turn by means of an iron pin at each end, revolving in sockets placed in the floor and upper point of attachment.

FIRST SERIES . . . *The pole held firm.*
SECOND SERIES . . . *The pole turning.*

First Series.

Position of attention facing the pole, the toes touching it.

Right hand leading.

EXERCISE I.
COURSE I.

1. Stoop forward and grasp the pole with the right hand, the left following immediately underneath it, slowly extend the trunk of the body along its surface; lift the right foot from the ground and place it against the left side of the pole, the knee on the right; lift the left foot from the ground and place it under the pole, clasping it with the back of the ankle, the trunk of the body in a straight line along its surface, the head slightly bent back, the eyes directed to the reach of the hands; straighten the knees and elongate the trunk.

2. Advance the right hand to the reach, the left following, draw up the lower limbs, tightening the clasp of the hands, straighten the knees and elongate the trunk to the rest of the hands. Repeat.

In descending, slip the left hand down opposite the breast, the right following, lower the body to the reach of the hands. Repeat.

The positions in this exercise are the same as shown in Figs. 5, 6, and 7 on the slanting pole.

This exercise to be repeated with the left hand leading.

Hand over hand.

EXERCISE 2.
COURSE II.

1. Come to the position on the pole, as in the previous exercise.

2. Advance the left hand to the reach, draw up the lower limbs, tightening the clasp of the hands, straighten the knees and elongate the trunk to the rest of the right hand. Repeat, raising the right hand to the reach, the right and left hand alternating throughout.

In descending, slip the leading hand down opposite the breast, lower the body to the reach of the supporting hand. Repeat.

Both hands at once.

EXERCISE 3.
COURSE II.

1. Come to the position on the pole, as previously.

2. Shoot up both hands to the reach, draw up the lower limbs, tightening the clasp of the hands, straighten the knees and elongate the trunk to the rest of the hands. Repeat.

In descending, slip both hands down opposite the breast, lower the body to the reach of the hands. Repeat.

Second Series.

Position of attention facing the pole, the toes touching it.

Right hand leading.

EXERCISE 4.
COURSE II.

1. Come to the position on the pole, as previously.

2. Advance the right hand to the reach, the left following, draw up the lower limbs, and elongate the trunk to the half reach of the hands, and during the last movement give the pole one quarter turn from right to left. Repeat.

In descending, slip the left hand down opposite the breast, the right following, lower the body to the half reach of the hands, and during the last movement give the pole one quarter turn, as on the ascent. Repeat.

This exercise to be repeated with the left hand leading, and turning the pole from left to right.

Hand over hand.

EXERCISE 5. COURSE II. 1. Come to the position on the pole, as previously.

2. Advance the left hand to the reach, draw up the lower limbs, elongate the trunk to the half reach of the right hand, and during the last movement give the pole one quarter turn from right to left. Repeat.

In descending, slip the leading hand down opposite the breast, and while lowering the body to the half reach of the supporting hand give the pole one quarter turn, as on the ascent. This is to be repeated with the other hand, so that the pole will be kept continuously turning during the descent.

Both hands at once.

EXERCISE 6. COURSE III. 1. Come to the position on the pole, as previously.

2. Shoot up both hands to the reach, draw up the lower limbs, and elongate the trunk to the half reach of the hands, and during the last movement give the pole one half turn from right to left.

In descending, slip both hands down opposite the breast, lower the body to the half reach of the hands, and during the last movement give the pole one half turn from right to left, as on the ascent.

This exercise to be repeated, turning the pole from left to right.

2. Shoot up both hands to the reach and elevate the body to the rest of the hands. Repeat.

In descending, lower the body until the hands are at the reach; slip both hands down opposite the breast. Repeat.

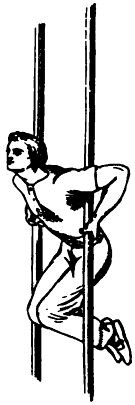
Second Series.

Position of attention between the poles.

Right hand leading.

EXERCISE 4. COURSE IV. 1. Stoop forward from the waist, bringing the head and shoulders in front of the poles, bend the arms and draw up the hands to the rear until they are nearly as high as the armpits, and grasp the poles, the palms behind the poles, the thumbs to the front; lift both feet from the ground, bending the legs, the feet to the rear, the toes pointed to the rear (Fig. 3).

Fig. 3.



2. Slip the right hand up and grasp the pole, aiding it by the elevation of the right side and right leg, the left hand following, with the corresponding side and leg. Repeat.

In descending, slip the right hand down and grasp the pole, and at the same time lower the right side and right leg, the left hand following with the corresponding side and leg. Repeat.

This exercise to be repeated with the left hand leading.

Hand over hand.

EXERCISE 5. COURSE IV. 1. Come to the position between the poles, the grasp reversed, the legs suspended as in the previous exercise (Fig. 3).

2. Slip the right hand up and grasp the pole, aiding it by the elevation of the right side and leg; slip the

THE PAIR OF VERTICAL POLES.

THE range of exercises on this machine is not wide, but every one is of a high class; they are all arduous, and are approached through those of the single pole. The learner should never be allowed to attempt them until he is master of the second series on the single pole.

When well executed they are very elegant, and show at a glance the power at the command of the climber, the body being sustained in perfect position between the poles by the hand-grasp alone. For these reasons this machine is always a favourite with able climbers.

The instructor must be careful to give the 'halt' whenever there is any kick or struggle of the lower limbs or trunk, or whenever the full step is not made by the hands, or the elevation of the trunk after the reach is not completed, indicating local or general fatigue, and therefore insecurity of grasp. This applies most especially to the two last exercises, where the feet are removed from the vertical line.

In the fifth exercise the climber must be instructed to be careful to keep the feet between the poles and to guard against their passing to the rear with the poles clashing in front; in this exercise the knees should be kept well bent, the lifting of the lower limbs should be at the instant of the elevation of the hand, and the alternate action of the right and left sides should be rhythmical, both in the ascent and descent. Another point requiring attention in this exercise is, when the climber nears the top (supposing he is sufficiently advanced to climb the length of the poles), that the 'halt' shall always be given and the climber not allowed to look upwards to ascertain his position; it would be in this act that a loss of equilibrium would most readily occur.

The instructor's place should be right or left of the poles, according as the climber shows a tendency to lose his equilibrium to front or rear, in order that he may be able to interpose his right hand in such a case. In the early practice of the third and last exercises, two instructors, or an instructor and a monitor, should be placed right and left of the machine, on occasions when it is thought desirable to let the climber do his uttermost; but, as above directed, for general practice the 'halt' should be given at the slightest indication of fatigue or failing power, and while he has yet strength to accomplish the descent.

The pair of vertical poles should be 1½ inch in diameter and 18 inches apart, and not less than 12 feet or more than 18 feet high.

First Series . . . *Upright.*
Second Series . . . *Hands reversed.*
Third Series . . . *The legs up.*

First Series.

Position of attention between the poles.

Right hand leading.

EXERCISE I.
COURSE II.

1. Raise the right hand to the reach and grasp the right pole, the left following on the left pole; lift both feet from the ground, bringing the hands to the half reach, the shoulders flat, the

chest advanced, the trunk of the body upright and held firm, the neck free, the chin elevated, the eyes directed to the front, the legs straight and together, the feet together, the toes pointed to the ground, the whole column of the body sustained in the line of the poles (Fig. 1).

Fig. 1.

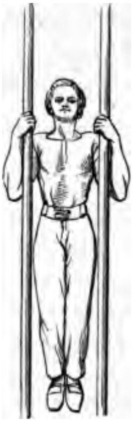
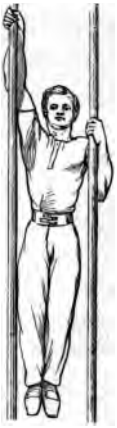


Fig. 2.



2. Raise the right hand to the reach (Fig. 2), the left following; elevate the body to the half reach of the hands. Repeat.

In descending, slip the right hand down opposite the breast, the left following; lower the body to the half reach of the hands. Repeat.

This exercise to be repeated with the left hand leading.

Hand over hand.

EXERCISE 2.
COURSE III.

1. Come to the position between the poles, the legs suspended, as in the previous exercise (Fig. 1).

2. Raise the right hand to the reach and elevate the body to the rest of the left hand; raise the left hand to the reach and elevate the body to the rest of the right hand. Repeat.

In descending, slip the leading hand down opposite the breast, and lower the body to the reach of the supporting hand. Repeat.

Both hands at once.

EXERCISE 3.
COURSE III.

1. Come to the position between the poles as previously, raising both hands at the same time.

2. Shoot up both hands to the reach and elevate the body to the rest of the hands. Repeat.

In descending, lower the body until the hands are at the reach ; slip both hands down opposite the breast. Repeat.

Second Series.

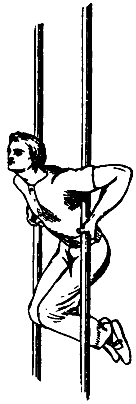
Position of attention between the poles.

Right hand leading.

EXERCISE 4.
COURSE IV.

1. Stoop forward from the waist, bringing the head and shoulders in front of the poles, bend the arms and draw up the hands to the rear until they are nearly as high as the armpits, and grasp the poles, the palms behind the poles, the thumbs to the front ; lift both feet from the ground, bending the legs, the feet to the rear, the toes pointed to the rear (Fig. 3).

Fig. 3.



2. Slip the right hand up and grasp the pole, aiding it by the elevation of the right side and right leg, the left hand following, with the corresponding side and leg. Repeat.

In descending, slip the right hand down and grasp the pole, and at the same time lower the right side and right leg, the left hand following with the corresponding side and leg. Repeat.

This exercise to be repeated with the left hand leading.

Hand over hand.

EXERCISE 5.
COURSE IV.

1. Come to the position between the poles, the grasp reversed, the legs suspended as in the previous exercise (Fig. 3).

2. Slip the right hand up and grasp the pole, aiding it by the elevation of the right side and leg; slip the

left hand up the distance of the step beyond the right. Repeat.

In descending, slip the right hand down and grasp the pole, at the same time lowering the right side and leg; slip the left hand down the distance of the step beyond the right. Repeat.

Both hands at once.

EXERCISE 6.
COURSE IV.

1. Come to the position between the poles, hands reversed, as previously.

2. Slip both hands up the distance of the step, and grasp the pole, retaining the arms bent. Repeat.

In descending, slip both hands down the distance of the step, retaining the arms bent. Repeat.

Third Series.

Position of attention between the poles.

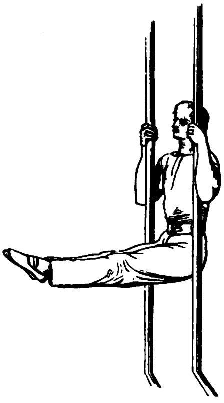
Right hand leading.

EXERCISE 7.
COURSE III.

1. Raise both hands and grasp the poles at the half reach; lift both feet from the ground and extend the lower limbs horizontally at a right angle to the trunk, the legs straight and together, the feet together, the toes pointed to the front, the trunk of the body upright, the neck free, the head slightly held back, the eyes directed to the reach of the hands (Fig. 4).

2. Raise the right hand to the reach and grasp the pole, the left following on the left; elevate the body to the *half reach* of the hands. *Repeat.*

Fig. 4.



In descending, slip the right hand down and grasp the pole, the left following, and lower the body to the half reach of the hands. Repeat.

This exercise to be repeated with the left hand leading.

Hand over hand.

EXERCISE 8.
COURSE III.

1. Come to the position between the poles, the legs up, as in the previous exercise (Fig. 4).

2. Raise the right hand to the reach and grasp the pole; raise the left hand to the reach and grasp the pole beyond the right, retaining the trunk and lower limbs in position. Repeat.

In descending, slip the right hand down and grasp the pole; slip the left hand down and grasp the pole below the right, retaining the trunk and lower limbs in position. Repeat.

Both hands at once.

EXERCISE 9.
COURSE IV.

1. Come to the position between the poles, the legs up, as previously.

2. Raise both hands to the reach and grasp the poles right and left, at the same time raising the trunk and lower limbs in position. Repeat.

In descending, slip both hands down opposite the breast, and grasp the poles right and left, retaining the body and lower limbs in position. Repeat.

THE PAIR OF SLANTING POLES.

THE exercises on this machine bear a great resemblance in character to the second series on the single slanting pole, and all are of an initiatory character. They are excellent for beginners, as giving much movement in a good position, and they yield also good practice for more advanced climbers, when the object is the attainment of speed in the step in both the ascent and descent. A chief point to be observed in them is, that the equipoise of the body shall be sustained by the 'rest' of the limbs, upper and lower; and they are consequently very valuable for the strengthening of these parts.

With beginners the instructor will require to be strict as to position and action, as on the accuracy of these depend the ease and safety of the ascent; these correctly acquired, and the poles fixed securely, there is little or no danger from falls, and none from any other source. Every opportunity should be seized of cultivating these exercises, for the reasons stated above, and also for the reasons advanced for the practice of those on the single *slanting and turning* poles.

The position of the instructor should be on the left of the machine, facing it.

The pair of slanting poles should be similar to the single pole and laid at the same angle; they should be 14 inches apart.

Single Series.

Position of attention facing the poles, close to them.

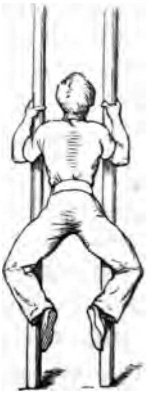
Right hand leading.

EXERCISE I.
COURSE I.

1. Lean forward, and with the right hand at the half reach grasp the right pole, the left hand following on the left pole; lift the right foot from the ground and place the instep against the inside of the right pole, the knee on the outside, the lower part of the leg crossing the pole diagonally, the left following on the left pole; extend and sustain the trunk between and in the line of the poles, the head held back and the eyes directed to the reach of the hands (Fig. 1).

2. Raise the right hand to the reach, the left following on the left pole, draw up the lower limbs and elongate the trunk to the rest of the hands. Repeat.

Fig. 1.



In descending, slip the left hand down opposite the breast, the right following on the right pole, lower the body to the reach of the hands. Repeat.

This exercise to be repeated with the left hand leading.

Right side leading.

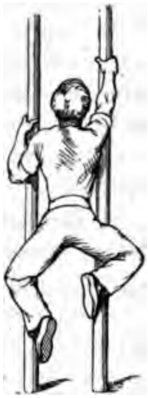
EXERCISE 2.
COURSE I.

1. Come to the position between the poles, the legs resting upon them, as in the previous exercise (Fig. 1).

2. Raise the right hand to the reach, and at the same time draw up the right foot (Fig. 2), elongate the trunk, and at the same time raise the left hand and left foot opposite the right hand and right foot. Repeat.

In descending, pass the leading hand down opposite the breast, extending the corresponding leg, the supporting hand and foot following, at the same time lowering the body. Repeat.

Fig. 2.



This exercise to be repeated with the left side leading.

Right and left side.

EXERCISE 3.
COURSE II.

1. Come to the position between the poles, the legs resting upon them, as previously.

2. Raise the right hand to the reach, and at the same time draw up the right foot as in preceding exercise, elongate the trunk and raise the left hand and left foot the distance of the step beyond the right hand and right foot. Repeat.

In descending, pass the leading hand opposite the breast, extending the corresponding leg; lower the body and at the same time pass the supporting hand the distance of the step below the leading hand, and extend the corresponding *leg. Repeat.*

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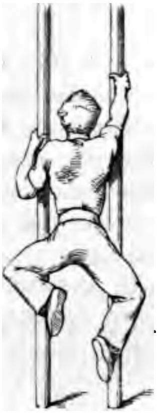
Right and left, hand and foot.

EXERCISE 4.
COURSE III.

1. Come to the position between the poles, the legs resting upon them, as previously.

Fig. 3.



2. Raise the right hand to the reach, and at the same time draw up the left foot (Fig. 3), elongate the trunk and at the same time raise the left hand the distance of the step above the right, and the right foot the same distance above the left. Repeat.

In descending, pass the leading hand down opposite the breast, extending the opposite leg, lower the body and at the same time pass the supporting hand down below the leading hand and extend the opposite leg. Repeat.

Both hands at once.

EXERCISE 5.
COURSE III.

1. Come to the position between the poles, the legs resting upon them, as previously.

2. Shoot up both hands to the reach, draw up the lower limbs, and elongate the trunk to the rest of the hands. Repeat.

In descending, slip both hands down opposite the breast, and lower the body to the reach of the hands. Repeat.

All the foregoing exercises to be repeated with the feet on the outside of the poles, the knees inside.

THE VERTICAL ROPE.

It will be seen by comparing the exercises on the vertical rope with those on its companion machine, the vertical pole, that there is a marked similarity between them.

The exercises on both machines divide themselves into two series, which are marked by the same distinctions, viz. that the exercises of the first are executed by the effort of the entire body, and those of the second by the effort of the upper limbs alone.

The first series on the rope is larger than on the pole, because it admits of a greater number of modes of employing the lower limbs; the 'full turn' and the 'stirrup' being peculiar to the rope, and each of these is an admirable mode of climbing in both an elementary and a practical sense. In the latter view, the 'stirrup' is specially valuable, as the rest in this position relieves the upper limbs, and in a great measure sets one hand free to execute any purpose for which the ascent may have been made; this exercise can only be performed on a loose rope, and although a comparatively slow manner of ascending, it is generally found to be the easiest to beginners, as it affords a very firm support to the feet; these must only be lifted sufficiently high to bring the hand to the rest when the step is completed.

The second series is in all respects identical with the corresponding one on the pole, except that it contains no *exercises with both* hands at once, this being possible only in the first series, where the clasp of the lower limbs holds the rope firm and straight, and thus enables the hands, without quitting the rope, to pass upwards. This series on the rope, however, admits of another exercise, in character almost identical with the seventh on the pair of poles, in which the lower limbs are held straight to the front at a right angle to the body of the climber and the machine.

The first series should be carefully practised before the learner is allowed to begin the second; and the instructor must be careful to give the 'halt' when the slightest symptom of fatigue or irregularity in the step appears. The learner should be instructed to be careful in keeping the column of the body perfectly upright in the line of the rope, and held close in, with the face at the hands, when at the rest; and also in keeping the eyes steadily directed to the reach of the hands, as recommended in the text, and on no account to direct them downwards, or far above the reach, or to allow the head to fall from the perpendicular line of the body. Neglect of these rules does not merely involve the loss of the equilibrium, but it distracts and divides the attention of the climber, besides giving an appearance of timidity to his efforts.

In the event of a slip the effort must be, not as with the pole, to slip downwards, for the rope passing through the hands of a falling man would cut it to the bone, but to re-grasp the rope. In all the exercises of the second series care must be taken that the climber has no articles of clothing hanging loose or standing prominent about the breast or waist, especially in the descent; as, after the sense of touch has been deadened by the climb, the hand may grasp these instead of the rope in passing to the rest.

It is also most desirable to accustom the climber to halt more than once during the ascent, and to change from one exercise to another on each recommencement of it. This is useful, not only for elementary, but for practical purposes, as it enables the climber to continue his ascent far beyond the distance attainable by a single mode of climbing, and also relieves, by a change of action and position, the parts engaged.

The position of the instructor should be the same as with the vertical pole.

The vertical rope may be of any length from 20 feet to 50 feet; there should be at least three sizes in a gymnasium, of the respective diameter of 1 inch, 1½ inch, 2 inches.

FIRST SERIES . . .	*With hands and feet.*
SECOND SERIES . . .	*With hands only.*
THIRD SERIES . . .	*The legs up.*

First Series.

Position of attention facing the rope.

Right hand leading.

The foot in the half turn.

EXERCISE I.
COURSE I.

1. Raise the right hand to the reach and grasp the rope, the left following (Fig. 1); lift the right foot from the ground and place it against the left side of the rope, the knee on the right side Fig. 2); lift the left foot and place it in front of the rope, the ankles crossing, the outside edges of the feet *together, the rope* between them (Fig. 3); straighten the *legs, elongate the* trunk; the whole column of the body

upright, the chest advanced, the shoulders flat, the elbows in by the sides, the hands at the half reach, the neck free, the head slightly bent back, the chin elevated, the eyes directed to the reach of the hands (Fig. 4).

2. Raise the right hand to the reach and grasp the rope, the left following; draw up the lower limbs, slightly relaxing but without relinquishing the clasp of the feet and without bending the arms, as in Fig. 3; tighten the clasp of the feet when elevated, straighten the knees and elongate the trunk to the rest of the hands, as in Fig. 4. Repeat.

Fig. 1.

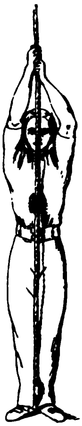


Fig. 2.

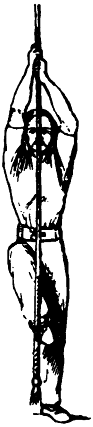


Fig. 3.

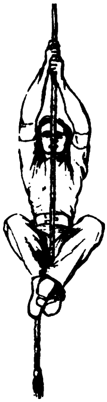
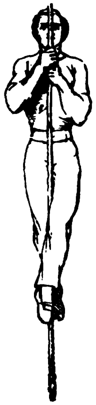


Fig. 4.



In descending, slip the left hand down opposite the breast, and grasp the rope, the right following; lower the body to the reach of the hands, retaining the legs straight and the rope between the feet. Repeat.

This exercise to be repeated with the left hand leading, the left foot under the rope, the right above it.

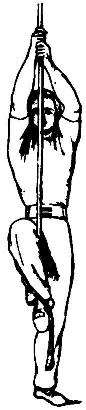
Right hand leading.

The foot in the full turn.

EXERCISE 2.
COURSE I.

1. Raise the right foot from the ground, and by a circular movement of the leg over the rope from the outside inwards, pass it round the leg so as to encompass it by a full turn, commencing on the inner side of the thigh and terminating on the inner side of the foot (Fig. 5); place the left foot in front of the rope, the ankles crossing as before; straighten the legs, and elongate the trunk.

Fig. 5.



2. Raise the right hand to the reach and grasp the rope, the left following; slacken the clasp of the feet, draw up the lower limbs without bending the arms, tighten the clasp of the feet, straighten the legs, and elongate the trunk to the rest of the hands. Repeat.

Descend as in the previous exercise.

This exercise to be repeated with the left hand leading, the left foot making the full turn.

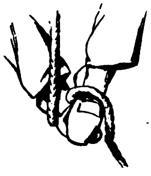
Right hand leading.

The foot in the stirrup loop.

EXERCISE 3.
COURSE I.

1. Lift the right foot from the ground and place it against the rope, as in first exercise. Lift the left foot from the ground and place it on the right side of the rope, and bringing it up from under the right with the end of the rope over the instep, rest the *front part of the* sole on the front part of *the instep of the* right (Fig. 6); the rope thus being folded

Fig. 6.



round the right foot, passing under its hollow, and tightly held in its place by the left, over which it falls; straighten the legs and elongate the trunk to the half reach of the hands.

2. Raise the right hand to the reach and grasp the rope, the left following; slacken the clasp of the feet, draw up the lower limbs without bending the arms, replace the left foot on the right, lifting the rope with it as before, straighten the knees and elongate the trunk to the rest of the hands. Repeat. At the last step, relinquish the loop and place the left foot over the right, the ankles crossing.

Descend as previously.

This exercise to be repeated with the left hand leading and the left foot in the stirrup loop.

Hand over hand.

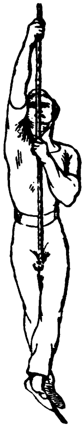
EXERCISE 4.
COURSE II.

1. Come to the position on the rope, the foot in the half turn (Fig. 4).

2. Raise the right hand to the reach and grasp the rope (Fig. 7), draw up the lower limbs without bending the right arm, straighten the legs, and elongate the trunk to the rest of the right hand. Repeat, raising the left hand to the reach; the right and left hand alternating throughout.

In descending, slip the leading hand down opposite the breast and grasp the rope, lower the body to the reach of the supporting hand, retaining the legs straight and the rope between the feet. Repeat.

Fig. 7.



This exercise to be repeated with the foot in the full turn and in the stirrup loop.

Hand over hand.

A Second Method.

EXERCISE 5.
COURSE II.

1. Come to the position on the rope, the foot in the half turn, as previously.

2. Raise the left hand to the half reach above the right, and raise the right to the reach above the left, draw up the lower limbs, straighten the legs, and elongate the trunk. Repeat.

Descend as in the previous exercise.

Both hands at once.

EXERCISE 6.
COURSE II.

1. Raise both hands to the reach and grasp the rope; lift both feet from the ground and clasp the rope with the foot in the half turn, the ankles crossing, bringing the hands to the half reach, as in Fig. 4.

2. Shoot up both hands to the reach, draw up the lower limbs without bending the arms, straighten the legs and elongate the trunk. Repeat.

In descending, slip both hands down opposite the breast and grasp the rope, lower the body to the reach of the hands. Repeat.

With one hand.

EXERCISE 7.
COURSE III.

1. Raise the right hand to the reach and grasp the rope; spring from the ground

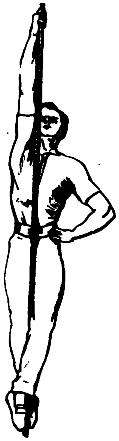
and clasp the rope with the foot in the half turn, the ankles crossing, bringing the right hand to the half reach; place the left hand on the hip joint, the fingers to the front, the thumb to the rear, the rest of the body in position (Fig. 8).

2. Tighten the clasp of the feet, raise the right hand to the reach, draw up the lower limbs without bending the arm, straighten the knees and elongate the trunk. Repeat.

In descending, slip the right hand down opposite the breast, lower the body to the half reach of the hand. Repeat.

This exercise to be repeated with the left hand.

Fig. 8.



Second Series.

Position of attention facing the rope.

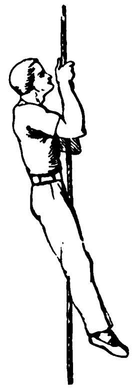
Right hand leading.

EXERCISE 8.
COURSE III.

1. Raise the right hand to the reach and grasp the rope, the left following; lift both feet from the ground and pass them to the right side of the rope, the hands at the half reach, the legs together and straight, and slanting to the front, the toes pointed in the same direction, the trunk of the body held firm and upright, the chest advanced, the shoulders flat, the elbows in by the sides, the head slightly bent back, the eyes directed to the reach of the hands (Fig. 9).

2. Raise the right hand to the reach and grasp the rope, the left following; elevate the body to the half reach of the hands. Repeat.

Fig. 9.



At the last step, clasp the rope with the foot *in the* half turn, the ankles crossing, and descend as usual.

This exercise to be repeated with the lower limbs on the left side of the rope.

These exercises to be repeated with the left hand leading.

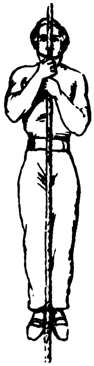
Hand over hand.

EXERCISE 9.
COURSE III.

1. Raise the right hand to the reach and grasp the rope, the left following; lift both feet from the ground, raising the body until the hands are at the half reach, the legs straight and together, the toes pointed downwards and slightly turned out (the rope lying between them), the column of the body perfectly upright and in the line of the rope, the head erect, the eyes directed to the reach of the hands (Fig. 10).

2. Raise the right hand to the reach, elevating the body to the rest of the left; raise the left hand to the reach, elevating the body to the rest of the right. Repeat. At the last step clasp the rope with the feet, and descend as usual.

Fig. 10.



Third Series.

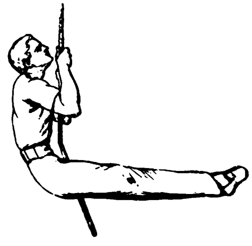
Position of attention facing the rope.

Right hand leading.

EXERCISE 10.
COURSE III.

1. Raise the right hand to the reach and grasp the rope, the left following; bend the arms and lift both feet from the ground and extend the lower limbs horizontally on the right side of the rope, the legs straight and together, the feet together, the toes pointed to the front, the trunk of the body upright, the neck free, the head slightly bent *back, the eyes directed to the reach of the hands (Fig. 11).*

Fig. 11.



2. Raise the right hand to the reach and grasp the rope, the left following; elevate the body to the half reach of the hands. Repeat. At the last step, clasp the rope with the feet, and descend as usual.

This exercise to be repeated with the left hand leading.

Hand over hand.

EXERCISE 11.
COURSE III.

1. Come to the position on the rope, the legs up, as in the previous exercise (Fig. 11).

2. Raise the right hand to the reach and grasp the rope; raise the left hand to the reach and grasp the rope beyond the right, retaining the body and lower limbs in position. Repeat.

THE ROSARY.

The single exercise on this machine is a very valuable one for elementary practice, as it shows at a glance the perfect action of the step on all climbing apparatus; for it is on this only that the perfect rest for the foot, and the adequate fulcrum for the effort in straightening the knee and elongating the trunk, are obtained. When, therefore, it is desirable to show to a beginner the precise movements which go to make the step in climbing, and their sequence, he should be taken to the rosary and have there explained to him that these same consecutive movements compose the step on all climbing machines where both hands and feet are engaged; the firmness of the clasp of the lower limbs supplying the rest presented to the soles of the feet by the beads of the rosary.

As a purely elementary exercise it is valuable also on account of the employment which it gives to the muscles of the back.

In the initiatory instruction care must be taken that the climber preserves the position perfectly, for the tendency of the action of straightening the knees is to push the feet to the front, and with them the lower part of the rosary, thus throwing the weight of the body on the arms.

The position of the instructor should be immediately beneath and behind the climber, with the right hand disengaged, and the left steadying the machine.

The rosary consists of a vertical rope, on which are strung, at intervals of from 12 to 18 inches, elm beads, turned to the shape of half a ball, 4 inches in diameter, the flat side being upwards. The rope should not be less than 15 feet or more than 20 feet high.

Single Series.

Position of attention facing the rosary.

The simple climb.

SINGLE EXERCISE. COURSE I. 1. Raise the right hand to the reach and grasp the rope, the left following; lift both feet from the ground and place them on the first bead (Fig. 1), the heels together, the toes pointed to the front, the rope as it were rising from the hollow between the feet and ascending in front of the ankle joint; straighten the knees and elevate the body to the half reach of the hands, the trunk upright, the chest advanced, the shoulders

Fig. 1.

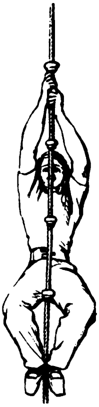


Fig 2.

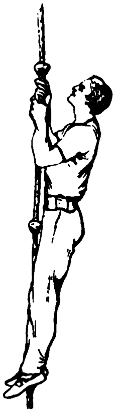
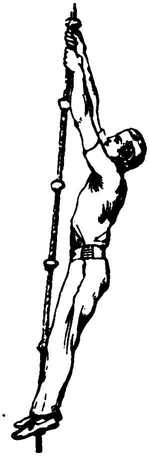


Fig. 3.



lat and square to the front, the head slightly held back, he eyes directed to the reach of the hands (Fig. 2).

2. Raise the right hand to the reach, the left following Fig. 3), lift both feet and place them on the second bead, traighten the knees and elongate the trunk. Repeat.

In descending, pass the left hand down to the rest, the ight following; slightly separate the feet, and retaining the ower limbs perfectly straight and the rest of the body in osition, lower the feet to the next bead. Repeat.

This exercise may be varied and the difficulty progressively ncreased by passing one, two, or more beads at each step. iving special care to the hand-grasp during the elongatory novement of the trunk.

To rest on the rosary.

First Method. Press the chest and shoulders to the front, thereby bringing the weight almost entirely on the feet.

Second Method. Press the breast, cheek, and temple of one side against the rope, at the same instant relieving, by change of position, the corresponding hand.

Third Method. Pass both feet to the front, and sit on the nearest bead. The entire descent may be made in this manner.

THE MAST.

ALL the exercises on this machine are of an arduous kind, requiring strong and combined effort from the entire frame.

The power of climbing a perfectly smooth column or pillar may be greatly increased by practice; but such practice with the young or less robust must be conducted with much care and discretion, because during part of the combined movement comprising the step, the mast presses on the front and lower region of the chest, and therefore interferes with the freedom of respiration. For this reason short distances only should be attempted in the initiatory lessons.

The position of the instructor should be the same with this machine as with the vertical pole.

The mast should be a Norway spar, not less than 10 inches or more than 12 inches in diameter at the base, and diminishing gradually towards the top; its length may be from 40 feet to 60 feet.

FIRST SERIES . . . *With hands and feet.*
SECOND SERIES . . . *With hands only.*

First Series.

Position of attention facing the mast.

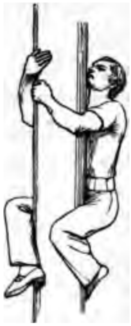
Hand over hand.

EXERCISE I.
COURSE III.

1. Raise the right hand to the reach, half encircling the mast on the right side, the palm of the hand open, the fingers extended but touching each other, the left hand

following, half encircling the mast on the left side, under the right; lift the left foot from the ground and place it against the mast, the knee towards the left side, the foot towards the right side, the front of the leg crossing the mast diagonally, lift the right foot from the ground and pass it round the mast, the calf of the leg crossing it diagonally, the trunk of the body erect, the head well held back (Fig. 1).

Fig. 1.



2. Pass the left hand above the right to the reach, draw up the lower limbs and elongate the trunk; pass the right hand above the left and complete the movements of the step. Repeat.

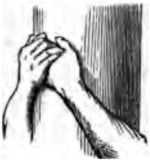
In descending, pass the leading hand down below the supporting one, lower the body the same distance. Repeat.

The hands overlapped.

EXERCISE 2.
COURSE III.

1. Raise the right hand to the reach as before directed, raise the left hand to the reach in a line with the right, and overlapping it, its fingers finding a grip on the ledge formed by the fingers and knuckles of the right (Fig. 2); lift the feet from the ground, and clasp the mast as before.

Fig. 2.



2. Raise the right hand to the reach, the left following and taking the overlap, draw up the lower limbs, and elongate the trunk. Repeat.

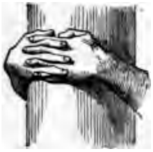
Descend as in the previous exercise.

The hands interlaced.

EXERCISE 3.
COURSE III.

1. Raise both hands to the reach, encircling the mast, separate the fingers of each hand as they approach each other and closely interlace them, the points of the fingers closely pressing the back of the opposite hand (Fig. 3); lift the feet from the ground and clasp the mast as before.

Fig. 3.



2. Shoot up both hands to the reach without relaxing the intergrasp, draw up the lower limbs and elongate the trunk. Repeat.

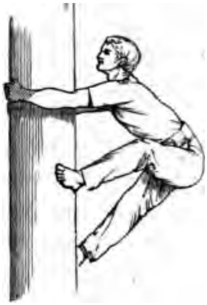
In descending, slip both hands down opposite the breast, retaining the intergrasp, lower the body to the reach of the hands. Repeat.

To walk the mast.

EXERCISE 4.
COURSE IV.

1. Raise both hands to the reach and grasp the mast, right and left, with the open palms; lift the right foot and place it with the sole flat against the face of the mast, the left following; the upper and lower limbs straight, the back flat, the head held back, the eyes directed to the reach of the hands.

Fig. 4.



2. Raise the left hand, and at the same time lift the left foot the distance of the step (Fig. 4); incline to the left, raise the right hand, and at the same time lift the right foot the distance of the step beyond the left. Repeat.

In descending, slip the leading hand and leading foot down the distance of the step. Repeat.

This exercise to be repeated, right and left, hand and foot.

This is the most rapid mode of climbing the mast; it should always be performed with the naked foot. It may also be performed on the vertical pole, fixed at the foot or suspended, on the slanting pole, and on the pair of slanting poles.

Second Series.

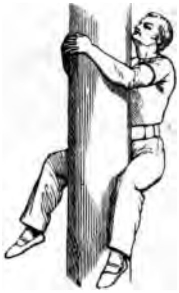
Position of attention facing the mast.

The hands only.

EXERCISE 5.
COURSE IV.

1. Raise both hands to the reach and encircle the mast, the hands interlaced as before directed; lift both feet from the ground, bending the arms to the half reach, the lower limbs pendent on each side of the mast, but not touching it, the knees slightly bent (Fig. 5).

Fig. 5.



2. Shoot up both hands the distance of the reach, retaining the intergrasp, and by the same action elevate the body, leaving the arms bent, as at the half reach. Repeat.

In descending, slip both hands down opposite the breast, retaining the intergrasp, and at the same time lower the body, leaving the arms bent, as at the half reach. Repeat.

To descend the mast rapidly.

Take the overlap or intergrasp, bring the head upright, and guide the rate of speed by the pressure of the upper and lower limbs, in a continuous descent.

To rest on the mast.

To rest the lower limbs.

First Method. Reverse their position on the mast.

Second Method. Take a secure grasp of the mast with the hands, and slowly detaching the lower limbs, stretch them down by the sides of the mast.

To rest the upper limbs.

Detach them one at a time from the mast, and opening the fingers and palm and relaxing every muscle of the hand and arm, let it hang by the side, or hold it in a position the reverse of that which it occupied during the ascent.

To rest the trunk of the body.

Strongly clasp the mast with the lower limbs, slowly separate the grasp of the hands, so as to set the chest and abdomen free.

APPENDIX

APPENDIX A.

Illustrations of certain forms of Growth and Development, regular and irregular, at different ages.

Fig. 1. Bust and Upper Limbs, showing perfectly regular and complete developments. Age 23.

,, 2. Arm (larger scale), showing very powerful developments. Age 24.

,, 3. Bust and Upper Limbs, showing regular and uniform developments. Age 18.

,, 4. Bust and Upper Limbs, showing regular but imperfect developments. Age 18.

,, 5. Bust and Upper Limbs, showing irregular growth; —'growing on one side.' Age 10.

,, 6. Back and Upper Limbs, showing similar irregularity of growth. Age 13.

,, 7. Back, showing spinal curvature.

,, 8. Back, showing spinal curvature. Another form.

,, 9. Bust, showing 'hollow chest.' Age 20.

,, 10. Bust and Upper Limbs, showing 'drooping shoulders.' Age 20.

,, 11. Bust, showing 'pigeon breast;' side view. Age 10.

,, 12. Bust (of same individual), showing 'pigeon breast;' front view.

,, 13. Bust, showing imperfectly developed chest. Age 21.

,, 14. Bust (of same individual), showing nature and extent of expansion of chest after a year's practice of systematized exercise.

Fig. 1.

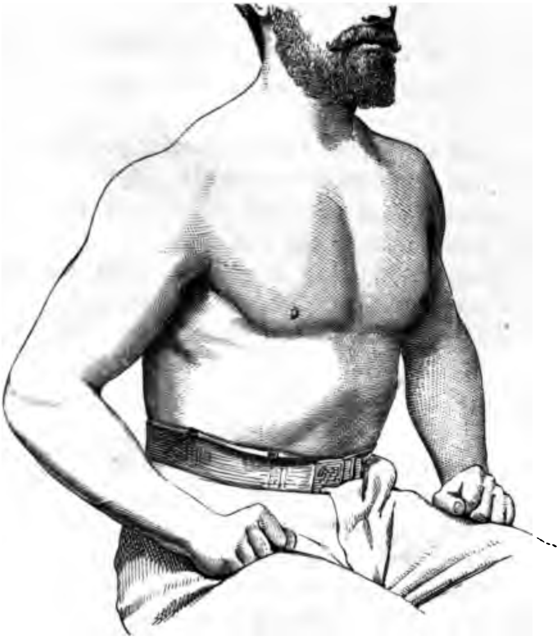


Fig. 2.

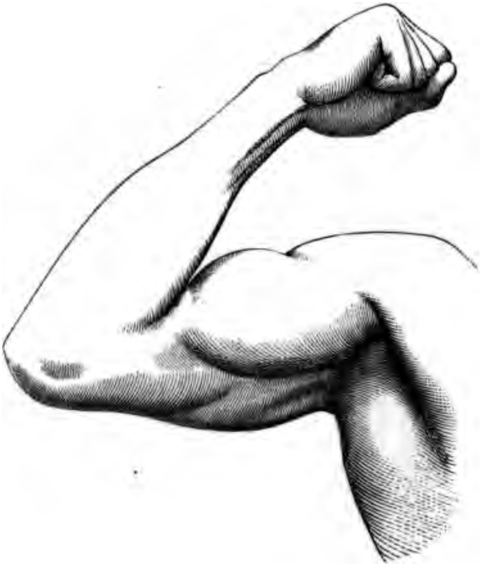


Fig. 5.

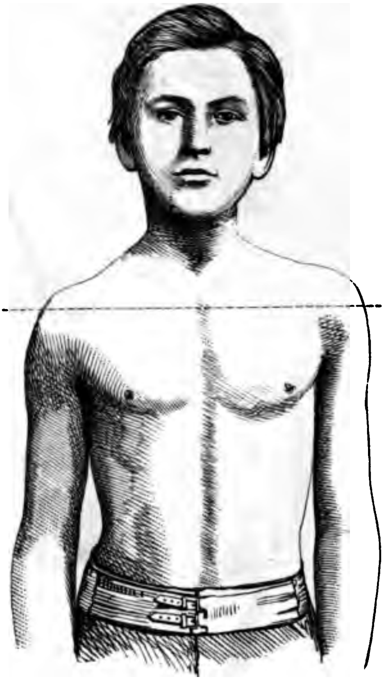


Fig. 6.

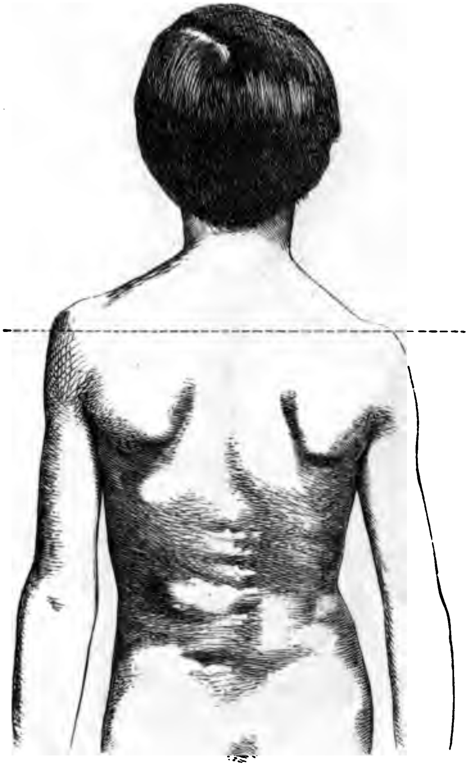


Fig. 7.

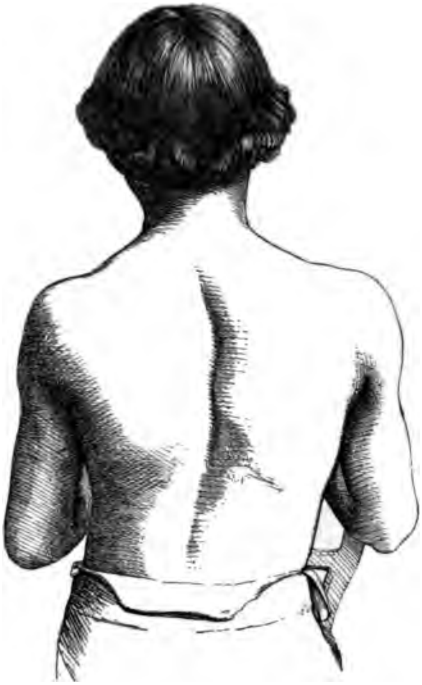


Fig. 8.

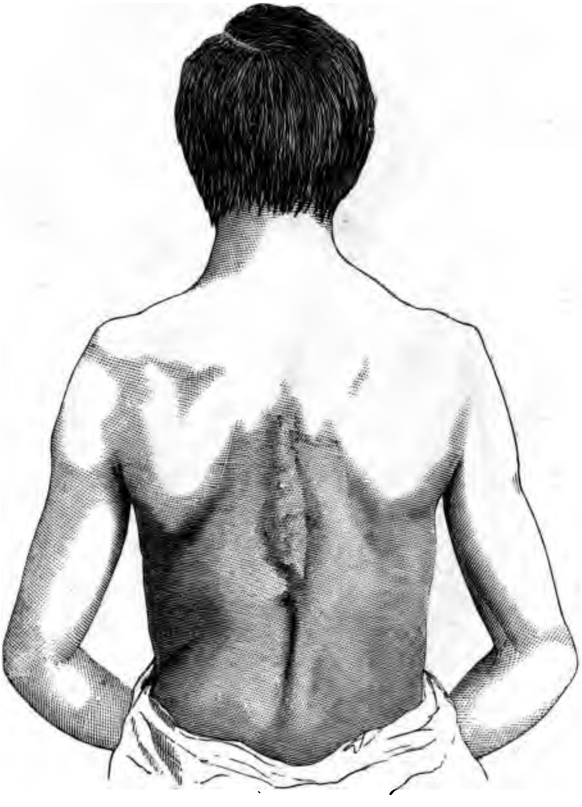


Fig. 9.

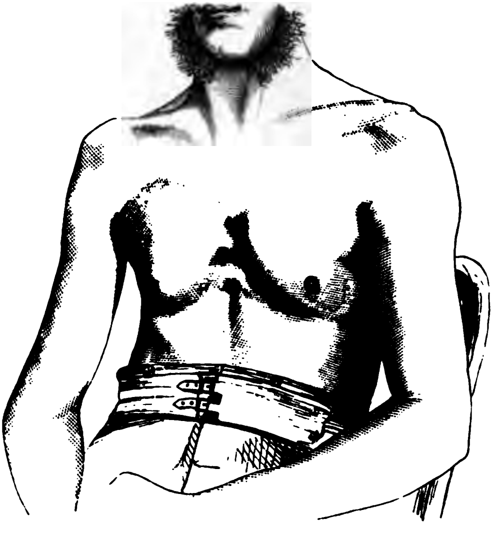


Fig. 10.

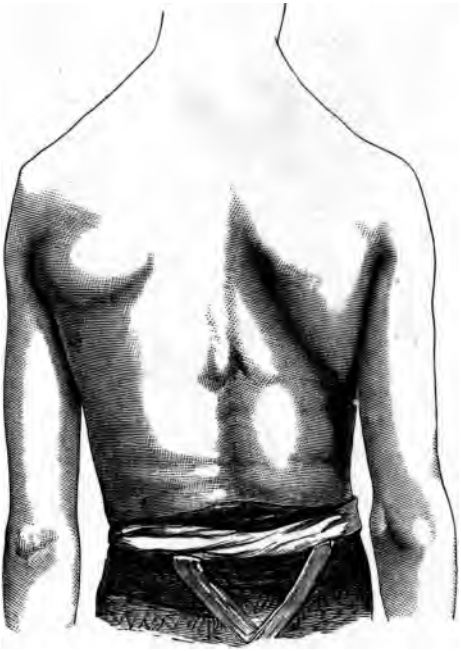


Fig. 11.

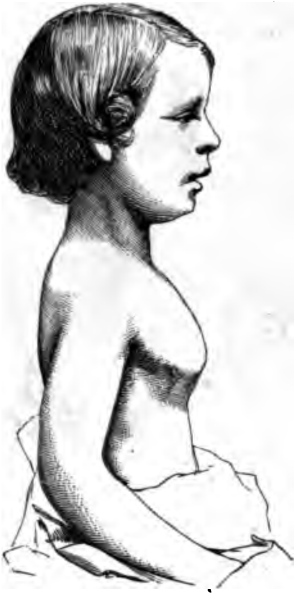


Fig. 12.

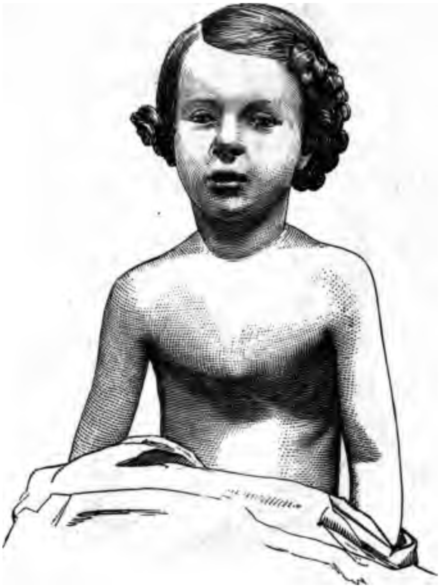


Fig. 13.

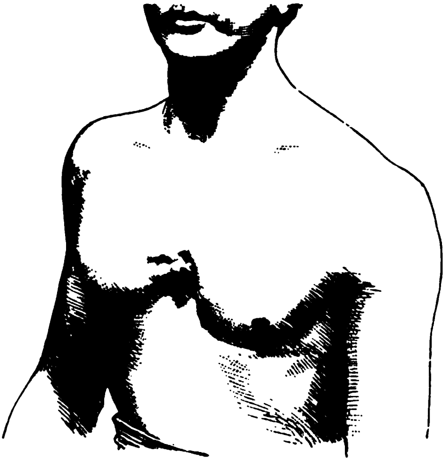
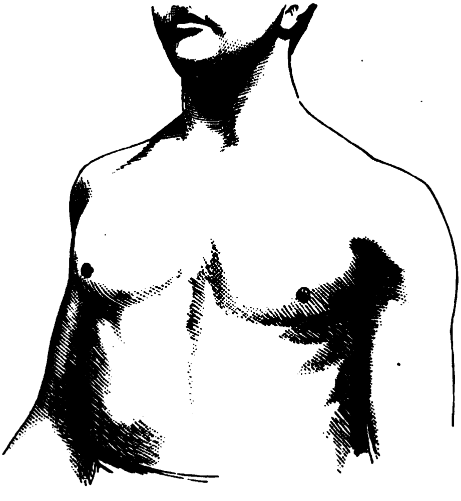


Fig. 14.



APPENDIX B.

Table showing the state of Growth and Development between the ages of 10 and 18 years, being the *averages* of the actual measurements of 100 boys at each age.

Age.	Height.		Weight.		Girth of Chest.	Fore-arm.	Upper arm.
Yrs.	Ft.	In.	St.	Lb.	In.	In.	In.
10	4	5½	4	9	25¼	7½	7¾
11	4	7	5	0	26¼	7¾	8
12	4	8¾	5	8¼	27½	8	8¼
13	4	10½	6	0¼	28½	8¼	8½
14	5	0¾	6	9	29½	8½	9
15	5	3	7	5½	30¾	9	9½
16	5	5	8	4½	32½	9½	10¼
17	5	7	9	2½	34¼	10	11
18	5	8	9	11	35¼	10¼	11¼

Abstract of preceding Table, showing average annual *rate* of Growth and Development from year to year.

	Height.	Weight.	Girth of Chest.	Fore-arm.	Upper arm.
	In.	Lb.	In.	In.	In.
From 10 years to 11 years.	1½	5	1	¼	¼
,, 11 ,, 12 ,,	2	8¼	1¼	¼	¼
,, 12 ,, 13 ,,	1¾	6	1	¼	¼
,, 13 ,, 14 ,,	2¼	8¾	1	¼	½
,, 14 ,, 15 ,,	2¼	10½	1¼	½	½
,, 15 ,, 16 ,,	2	13	1¾	½	¾
,, 16 ,, 17 ,,	2	12	1¾	½	¾
,, 17 ,, 18 ,,	1	8½	1	¼	¼

APPENDIX C.

TABLE showing the state of Growth and Development of men on arriving at the University; the averages being those of the first 100 names on the book of the Oxford University Gymnasium, all at or under 19 years of age.

Height	5 ft. 8¼ in.	(68·257 in.)
Weight	9 st. 7 lb.	(132·970 lb.)
Chest	33 in.	(32·953 in.)
Forearm	10 in.	(9·792 in.)
Upper arm	10¾ in.	(10·702 in.)

The greatest developments being—

Height	6 ft. 6 in.[1]
Weight	12 st. 2 lb.
Chest	39 in.
Forearm	11¾ in.
Upper arm	12¾ in.

The smallest developments being—

Height	5 ft. 2 in.
Weight	7 st.
Chest	27¼ in.
Forearm	8½ in.
Upper arm	8¾ in.

[1] *The chest* in this case was only 36 inches—age, 18.

APPENDIX D.

Table showing the influence of Systematized Exercise on boys of different conditions of Growth and Development, extending over periods of several years, by means of the Weekly Lesson.

Case.	Date of Measurement.	Measurements, &c. Age.	Height.		Weight.		Chest.	Fore-arm.	Upper arm.	Increase. Height.	Weight.	Chest.	Fore-arm.	Upper arm.	Remarks.
		Yrs.	Ft.	In.	St.	Lb.	In.	In.	In.	In.	Lb.	In.	In.	In.	
W.	1st year June.	10	4	6¾	4	10	26	7¼	7¼						Height *above* average; other measurements average. From commencement growth rapid and sustained, with regular and uniform development. The whole frame advancing to great physical power.
	2nd ,, Sept.	11	4	9¼	5	5	28½	8½	8¼	2½	9	2½	1¼	1	
	3rd ,, Sept.	12	4	10¾	6	0	30½	8½	8⅞	1½	9	2	,,	⅝	
	4th ,, June.	13	5	2¼	7	2	32½	9⅝	9⅞	3½	16	2	⅛	1	
	5th ,, May.	14	5	5⅞	8	3	35½	9¾	10¼	3⅝	15	3	⅛	⅜	
	6th ,, May.	15	5	9	10	2	37½	11	12	3⅛	27	2	1¼	1¾	
	7th ,, Sept.	16	5	9¼	10	13	38½	11⅛	12⅜	¼	11	1	⅛	⅜	
	8th ,, Sept.	17	5	10¾	11	2	39½	11¾	13⅜	1½	3	1	⅝	1	
							Total increase			16	90	13½	4½	6⅛	
H.	1st year June.	10	4	6¼	5	3	28¼	8	8¾						Height *slightly* above average; other measurements considerably above average. From commencement growth and development regular and continuous. The whole frame perfectly developed for this period of life. (See Fig. 3, App. A.)
	2nd ,, June.	11	4	8	5	9	29	8½	9½	1¾	6	¾	½	¾	
	3rd ,, Sept.	12	4	10½	6	3	29½	8½	9½	2½	8	½	,,	,,	
	4th ,, Sept.	13	5	0⅝	7	2	30½	9¼	10¼	1⅞	13	1	¾	¾	
	5th ,, June.	14	5	3½	8	3	33½	10	11	2⅞	15	3	¾	¾	
	6th ,, May.	15	5	5	9	0	35½	10½	11	1½	11	2	½	,,	
	7th ,, May.	16	5	5⅝	9	10	37	10⅝	12	⅝	10	1½	⅛	1	
	8th ,, Sept.	17	5	6	9	12	38¾	10¾	12½	⅜	2	1¾	⅛	½	
	9th ,, Sept.	18	5	7¾	10	4	39	11½	13½	1¾	6	¼	¾	1	
							Total increase			13½	71	10¾	3½	4¾	

B.	1st year Sept.	11	4	7	5	11	27	8½	8¾							Height *average*; other measurements above average. Growth and development at first slow, but regular; afterwards rapid and culminating.
	2nd ,, Sept.	12	4	8¼	6	1	29	8¾	9½		1¼	4	2	¼	¾	
	3rd ,, June.	13	4	10¾	6	9	30¾	9	10		2½	8	1¾	¼	½	
	4th ,, May.	14	5	1¾	7	12	33½	9⅝	10¾		3	17	2¾	⅝	¾	
	5th ,, May.	15	5	4¼	9	0	34½	10⅛	11⅛		2½	16	1	½	⅜	
							Total increase			.	9¼	45	7½	1⅝	2⅜	
F.	1st year Dec.	10	4	2½	4	7	25½	7½	7¾							Height *below* average; other measurements slightly below average. Growth and development at first slow and irregular; afterwards rapid, regular, and culminating.
	2nd ,, July.	10	4	3⅛	4	8	26½	8	8⅛		⅝	1	1	½	⅜	
	3rd ,, Mar.	11	4	5⅛	5	1	27	8	8⅛		2	7	½	,,	,,	
	4th ,, July.	12	4	7½	5	8	28¾	8⅝	8⅝		2⅜	7	1¾	⅝	½	
	5th ,, July.	13	4	10¼	6	7	30½	9⅛	9¾		2¾	13	1¾	½	1⅛	
	6th ,, Dec.	15	5	3⅜	8	6	34½	10⅛	10⅞		4⅝	27	4	1	1⅛	
							Total increase			.	12⅞	55	9	2⅝	3⅛	
S.	1st year Jan.	12	4	1⅞	3	13	23½	6½	6							Height and all other measurements *greatly* below average; the whole frame stunted and dwarfish. Advancement at first slight and very irregular; afterwards rapid and comparatively regular.
	,, July.	12	4	3¾	4	0	24	7	6¾		1⅞	1	½	½	¾	
	,, Dec.	13	4	4½	4	1	24½	7	7		¾	1	½	,,	¼	
	2nd ,, Dec.	14	4	4½	4	7	25	7¼	7¼		,,	6	½	¼	¼	
	3rd ,, July.	14	4	5⅜	4	8	26	7½	7½		⅞	1	1	¼	¼	
	4th ,, Mar.	15	4	7¼	4	12	26½	7⅝	7⅝		1⅞	4	½	⅛	⅛	
	5th ,, July.	16	4	11¼	6	6	29½	8⅝	8¾		4	22	3	1	1⅛	
							Total increase			.	9⅜	35	6	2⅛	2¾	
A.	1st year Dec.	14	4	5	6	1	26½	8	7¾							Height *greatly* below average; other measurements also considerably *below* average. Instant and extreme acceleration of growth with moderate increase in development: afterwards growth slightly above average, with great but irregular increase in other measurements.
	2nd ,, Sept.	14	5	2	6	4	29	9	9½		11	3	2½	1	1¾	
	3rd ,, July.	15	5	4½	7	7	30	9	9½		2½	17	1	,,	,,	
	4th ,, Sept.	16	5	7¼	8	12	34½	10	11¼		2¾	19	4½	1	1¾	
							Total increase			.	16¼	39	8	2	3½	

APPENDIX D (*continued*).

TABLE showing the effects of Systematized Exercise upon men of different degrees of Physical Power.

Case.	DATE OF MEASUREMENT.	MEASUREMENTS, &c.								INCREASE.					REMARKS.
		Age.	Height.		Weight.		Chest.	Fore-arm.	Upper arm.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.	
		Yrs.	Ft.	In.	St.	Lb.	In.	In.	In.	In.	Lb.	In.	In.	In	
H.	1st year Oct.	20	5	5⅛	7	1	29	8	8¼						Imperfectly developed, but not constitutionally delicate. The attendance during the last Term very irregular.
	,, Dec.	,,	,,		7	4	31	8⅜	9	,,	3	2	⅜	¾	
	2nd ,, Jan.	,,	,,		7	8½	31½	,,	9½	,,	4½	½	,,	½	
	,, June.	,,	,,		,,		,,	,,	,,	,,	,,	,,	,,	,,	
							Total increase .			,,	7½	2½	⅜	1¼	
R.	1st year Oct.	19	5	2⅝	8	0	30½	9	9½						Shapely and well-proportioned. A remarkable feature in this case is the renewal and steady continuation of the upward growth, which had been prematurely arrested.
	,, Dec.	,,	5	3¼	8	1	33	9½	10¼	⅝	1	2½	½	¾	
	2nd ,, Jan.	20	5	3⅝	,,		,,	,,	,,	⅜	,,	,,	,,	,,	
	,, ,,	,,	5	4⅛	,,		33½	9¼	,,	½	,,	½	Lost ¼	,,	
	,, June.	,,	5	4⅝	8	3	34	,,	,,	½	2	½	,,	,,	
	,, ,,	,,	,,		8	5	34¼	9½	10½	,,	2	¼	¼	¼	

P.	1st year Oct.	19	6	1½	12	1	35½	10¾	11½						Of large and strong frame, but heavy and inactive. The exercises were freely administered with the desire that a healthy fatigue should be experienced at the termination of each lesson.
	2nd ,, Jan.	,,		,,	12	3	38½	11	12	,,	2	3	¼	½	
	,, June.	,,		,,	12	4½	39½	,,	,,	,,	1½	1	,,	,,	
	,, ,,	,,		,,	,,		40	,,	12⅛	,,	,,	½	,,	⅛	
							Total increase .			,,	3½	4½	¼	⅝	
B.	1st year Oct.	17	6	0	9	4	30½	8¾	9¼						Of delicate frame; chest flat and narrow, with sternum much depressed. The exercises were changed almost daily: the lesson being always made to terminate before any distinct sense of fatigue was indicated by the action of the parts employed.
	2nd ,, Jan.	,,		,,	9	9	32½	9¼	10	,,	5	2	½	¾	
	,, June.	18	6	0½	9	11½	34	9¾	10¼	½	2½	1½	½	¼	
	,, ,,	,,		,,	9	13	34½	,,	10½	,,	1½	½	,,	¼	
							Total increase .			½	9	4	1	1¼	
T.	1st year May.	17	5	4	8	0	31	9	9						Delicate frame; the entire physical powers subdued from confinement and severe mental work.
	2nd ,, June.	,,	5	4¼	8	6	32¾	10	10¼	¼	6	1¾	1	1¼	
A.	1st year June.	19	5	10¾	10	2	35½	10¼	11						Powerful frame, with great energy.
	2nd ,, May.	20	5	11	11	0	38½	11¼	13	¼	12	3	1	2	
	3rd ,, July.	21	5	11½	11	6	40	,,	13¼	½	6	1½	,,	¼	
							Total increase .			¾	18	4½	1	2¼	

APPENDIX E.

Table of Measurements of First Detachment of Non-Commissioned Officers selected to be qualified as Military Gymnastic Instructors, taken at the commencement and conclusion of the course (about 8 months).

DATE OF MEASUREMENT.	No.	MEASUREMENTS, &c.								INCREASE.				
		Age.	Height.		Weight.		Chest.	Fore-arm.	Upper arm.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.
		Yrs.	Ft.	In.	St.	Lb.	In.	In.	In.	In.	Lb.	In.	In.	In.
Sept. 11.	1	19	5	8½	9	2	33	9½	10					
April 30.			5	8⅞	10	1	37½	10½	11¾	⅜	13	4½	1	1¾
Sept. 11.	2	21	5	9	10	5	34¾	10	11					
April 30.			5	9¼	11	1	38½	11	12¼	¼	10	3¾	1	1¼
Sept. 11.	3	23	5	5	9	7	34	10½	12					
April 30.			5	5¾	10	2	37½	11½	13¼	¾	9	3½	1	1¼
Sept. 11.	4	23	5	7¼	9	13	37	10¼	12					
April 30.			5	7¾	10	8	38½	11½	13	½	9	1½	1¼	1
Sept. 11.	5	23	5	8¼	9	10	36	10	11					
April 30.			5	8½	10	6	37	10½	12	¼	10		½	1
Sept. 11.	6	23	5	9⅛	11	3	36½	11	12					
April 30.			5	9¼	11	12	38½	11½	13	⅛	9	2	½	1
Sept. 11.	7	23	5	9	10	6	36	10¾	12					
April 30.			5	9⅛	10	11	38½	11	13	⅛	5	2½	¼	1
Sept. 11.	8	24	5	8¾	10	8	35	10¾	12¾					
April 30.			5	9¼	11	6	40	11¾	14	½	12	5	1	1¼
Sept. 11.	9	26	5	6¼	9	5	33	10	11½					
April 30.			5	6⅞	9	11½	36	10¼	12¾	⅝	6½	3	¼	1¼
Sept. 11.	10	26¾	5	11⅜	12	6	41	11½	13					
April 30.			5	11¾	13	1	42	11½	14	⅜	9	1	,,	1
Sept. 11.	11	28	5	7¾	10	10	37	10½	12½					
April 30.			5	8¼	11	9	40	11¾	13¾	½	13	3	1¼	1¼
Sept. 11.	12	28	5	10⅞	10	9	37	10½	13					
April 30.			5	11	11	11	40	11¾	14	⅛	16	3	1¼	1

Two men composing this detachment had been irregularly selected, the youngest being 19, the eldest 28, the average age 24; and after a period of eight months' training, the increase in the measurements of the men were—

	Weight.	Chest.	Forearm.	Upper arm.
	Lb.	In.	In.	In.
The smallest gain . .	5	1	¼	1
The largest gain . .	16	5	1¼	1¾
The average gain . .	10	2⅞	¾	1¾

BLE of Measurements of Second Detachment of Non-Commissioned)fficers selected to be qualified as Military Gymnastic Instructors, ;aken at the commencement and conclusion of the course (about 8½ nonths).

ΓE OF .SURE- ΞNT.	No.	MEASUREMENTS, &c.						INCREASE.			
		Age.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.	Weight.	Chest.	Fore-arm.	Upper arm.
		Yrs.	Ft. In.	St. Lb.	In.	In.	In.	Lb.	In.	In.	In.
. 27.	1	22	5 10⅜	9 13	34	10	10¾				
y 12.				10 6	38¼	11¼	12¾	7	4¼	1¼	2
. 27.	2	23	5 9⅜	12 0	36	10¾	12½				
y 12.				11 11	39½	12	14	Less 3	3½	1¼	1½
. 27.	3	24	5 10⅜	11 2¼	36⅜	10⅜	12				
y 12.				11 4	39½	11½	13½	1¾	3⅛	1⅛	1½
. 27.	4	25	5 9½	10 6	36½	11¼	12¼				
y 12.				10 4	38½	11½	12¾	Less 2	2	¼	½
. 27.	5	25	5 9⅝	9 12	34¼	10	11⅜				
y 12.				10 1	37⅜	10¾	12⅝	3	3⅛	¾	1¼
. 27.	6	25	5 9¼	11 2¾	38	10¾	12				
y 12.				11 4	40½	11⅝	13	1¼	2½	8	1
. 27.	7	25	5 11⅜	12 4	36½	11¼	12½				
y 12.				11 9	39	12	13½	Less 9	2½	¾	1
. 27.	8	25	5 9½	11 13	38	11¼	13				
y 12.				12 5	41½	11¾	14	6	3½	½	1
. 27.	9	25	5 8½	11 0	35	10¾	12¾				
y 12.				10 11	38½	11⅜	13½	Less 3	3½	⅝	¾
. 27.	10	28	5 10¼	12 3	38¼	10⅞	12				
y 12.				12 7	40½	12	14	4	2¼	1⅛	2

	Weight.	Chest.	Forearm.	Upper arm.
	Lb.	In.	In.	In.
The smallest gain . .	0	2	¼	½
The largest gain . .	7	4¼	1¼	2
The average gain . .	2⅓	3	⅞	1¼

APPENDIX F.

Table of Measurements taken at the Royal Military Academy, Woolwich, at the commencement and conclusion of short course (about 4½ months).

DATE OF MEASUREMENT.	No.	MEASUREMENTS, &c.								INCREASE.				
		Age.	Height.		Weight.		Chest.	Fore-arm.	Upper arm.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.
		Yrs.	Ft.	In.	St.	Lb.	In.	In.	In.	In.	Lb.	In.	In.	In.
Feb. 10.	1	18	5	1 2/8	7	8	29 4/8	9	8 6/8					
June 22.			5	2 2/8	7	8	30	9	9 4/8	1	”	4/8	”	6/8
Feb. 10.	2	19	5	8 4/8	9	5½	28	11	10 2/8					
June 22.			5	8 6/8	9	11	31 4/8	11	11 3/8	2/8	5½	3 4/8	”	1 1/8
Feb. 10.	3	17	5	5 6/8	9	1	26 4/8		8 4/8					
June 22.			5	6 1/8	9	1	29 4/8	10 3/8	10	3/8	”	3	”	1 4/8
Feb. 10.	4	18	5	8 2/8	10	0	33	10 6/8	10 2/8					
June 22.			5	8 4/8	10	3	35	10 6/8	11 4/8	2/8	3	2	”	1 2/8
Feb. 10.	5	18	6	0 4/8	10	13	32	10 4/8	9 2/8					
June 22.			6	1 2/8	11	2	34	10 4/8	10 7/8	6/8	3	2	”	1 5/8
Feb. 10.	6	17	5	3 4/8	8	1	31	10 1/8	9 7/8					
June 22.			5	4 4/8	8	7	33	10 1/8	11	1	6	2	”	1 1/8
Feb. 10.	7	18	5	5 2/8	7	13	26	9 2/8	7 7/8					
June 22.			5	5 6/8	8	2	29	9 4/8	9 4/8	4/8	3	3	2/8	1 5/8
Feb. 10.	8	16	5	6 6/8	8	3	28 4/8	9	8 4/8					
June 22.			5	7 2/8	8	4	31	9 1/8	9 4/8	4/8	1	2 4/8	1/8	1
Feb. 10.	9	17	5	8 3/8	11	3	31	11 2/8	10 2/8					
June 22.			5	9 1/8	11	3	33	11 2/8	11 1/8	6/8	”	2	”	7/8
Feb. 10.	10	18	5	11 5/8	11	8	30	10 2/8	10 4/8					
June 22.			5	11 5/8	11	8	33	10 6/8	11	”	”	3	4/8	[illegible]
Feb. 10.	11	19	5	7 6/8	10	2	33	10 4/8	10 2/8					
June 22.			5	8 5/8	10	2	34 4/8	10 4/8	10 7/8	7/8	”	1 4/8	”	5/8
Feb. 10.	12	18	5	10 4/8	10	11	32	10 4/8	10					
June 22.			5	11 7/8	10	11	33 4/8	10 4/8	11	1 3/8	”	1 4/8	”	1
Feb. 10.	13	19	5	7 7/8	11	13	33	11 4/8	12					
June 22.			5	9 5/8	11	13	35 4/8	11 4/8	12 4/8	1 6/8	”	2 4/8	”	4/8
Feb. 10.	14	17	5	6 6/8	9	13	29	10 5/8	8 2/8					
June 22.			5	7 5/8	10	3	32	10 5/8	9 4/8	7/8	4	3	”	1 2/8
Feb. 10.	15	19	5	10 4/8	10	1	27 4/8	10 5/8	9 3/8					
June 22.			5	11 7/8	10	9	32 5/8	10 5/8	10 7/8	1 3/8	8	5 [illegible]	”	1 4/8

E OF SURE- NT.	No.	MEASUREMENTS, &c.						INCREASE.				
		Age.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.
		Yrs.	Ft. In.	St. Lb.	In.	In.	In.	In.	Lb.	In.	In.	In.
. 10.	16	18	5 $3\frac{2}{8}$	8 13	29	$10\frac{1}{8}$	$10\frac{4}{8}$					
e 22.			5 $3\frac{4}{8}$	8 13	32	$10\frac{1}{8}$	$10\frac{7}{8}$	$\frac{2}{8}$	"	3	"	$\frac{3}{8}$
. 10.	17	18	5 $8\frac{6}{8}$	11 8	33	$11\frac{1}{8}$	$12\frac{7}{8}$					
e 22.			5 $9\frac{5}{8}$	11 8	$34\frac{4}{8}$	$11\frac{1}{8}$	$12\frac{7}{8}$	$\frac{7}{8}$	"	$1\frac{4}{8}$	"	"
. 10.	18	17	5 $6\frac{1}{8}$	9 8	27		$8\frac{6}{8}$					
e 22.			5 $7\frac{1}{8}$	9 8	$30\frac{4}{8}$	$10\frac{3}{8}$	10	1	"	$3\frac{4}{8}$	"	$1\frac{2}{8}$
. 10.	19	16	5 $6\frac{4}{8}$	8 10	$27\frac{6}{8}$	$9\frac{5}{8}$	$7\frac{4}{8}$					
e 22.			5 $6\frac{7}{8}$	9 1	$30\frac{4}{8}$	$9\frac{7}{8}$	$9\frac{4}{8}$	$\frac{3}{8}$	5	$2\frac{6}{8}$	$\frac{2}{8}$	2
. 10.	20	18	5 7	9 1	$28\frac{2}{8}$	10	$9\frac{4}{8}$					
e 22.			5 $7\frac{5}{8}$	9 1	31	10	$10\frac{4}{8}$	$\frac{5}{8}$	"	$2\frac{6}{8}$	"	1
. 10.	21	18	6 $1\frac{1}{8}$	11 12	$34\frac{6}{8}$		$11\frac{7}{8}$					
e 22.			6 2	11 12	$35\frac{7}{8}$	11	$12\frac{1}{8}$	$\frac{7}{8}$	"	$1\frac{1}{8}$	"	$\frac{2}{8}$

In this class it will be seen that the youngest was 16, the eldest 19; e average age being $17\frac{3}{4}$. In a course extending over 4 months, the crease was—

	Weight.	Chest.	Forearm.	Upper arm.
	Lb.	In.	In.	In.
The smallest gain . .	1	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{4}$
The largest gain . .	8	$5\frac{1}{4}$	$\frac{1}{2}$	$1\frac{5}{8}$
The average gain . .	$1\frac{3}{4}$	$2\frac{1}{2}$	$\frac{1}{16}$	1

APPENDIX G.

RESULT OF ONE YEAR'S CONTINUOUS PRACTICE.

The following Table shows in another form the results of the System; not by brief courses or periods of voluntary attendance, but by a year's steady practice from birthday to birthday, with two articled pupils, the younger being 16, the elder 20.

Case.	DATE OF MEASUREMENT.	MEASUREMENTS, &c.						INCREASE.				
		Age.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.	Height.	Weight.	Chest.	Fore-arm.	Upper arm.
		Yrs.	Ft. In.	St. Lb.	In.	In.	In.	In.	Lb.	In.	In.	In.
A.	Oct. 17.	16	5 2¾	7 10	31	8	9¼					
	Apr. 17.	16½	5 4	8 12	34½	10	11¼	1¼	16	3½	2	2
	Oct. 17.	17	5 4¾	9 3	36	10	11¼	¾	5	1½	,,	,,
	Subsequent Measurement.											
	Mar. 23.	17·5	5 6⅜	10 10	37½	11¼	13	1⅝	21	1½	1¼	1¾
B.	Feb. 24.	20	5 8½	10 13	34	11¼	11¾					
	Aug. 24.	20½	5 8⅞	11 4	38½	12	12¾	⅜	5	4½	¾	1
	Feb. 24.	21	,,	11 7½	40	12½	13¼	,,	8½	1½	½	½

Thus in the year's work the increase was—

	Height.	Weight.	Chest.	Forearm.	Upper arm.
	In.	Lb.	In.	In.	In.
With the younger .	2	21	5	2	2
With the elder . .	⅜	8½	6	1¼	1½

APPENDIX H.

A SYSTEM OF MEASUREMENTS

TO DETERMINE THE RATE OF GROWTH AND DEVELOPMENT.

Height (*without boots*). The position of *Attention.* The heels together, the knees braced back, the chin raised, the head held steady, the shoulders square to the front; the heels, hips, shoulders, and head touching the pillar of the standard. The height to the eighth of an inch to be reckoned.

> N.B.—This measurement, when repeated, should always be taken at the same time of the day, and after the same amount of bodily exertion.

Weight (*in working costume,* i.e. *in light shoes, flannel trowsers, flannel shirt or jersey*). The weight to a quarter of a pound to be reckoned.

> N.B.—This measurement, like the preceding, when repeated, should always be taken at the same time of day, and with reference to any circumstance which would affect its accuracy.

Chest (*over the jersey or naked breast*). The position of *Attention,* but with the arms horizontally extended, the palms of the hands held upwards and open, the fingers straight. The tape should be passed around the chest in the line of the nipple. The girth to the quarter of an inch to be reckoned.

> N.B.—Care must be taken that the chest is not inflated *beyond its usual* expansion during ordinary breathing. *Where a single* measurement is taken, the above line

is the best, as gauging approximately at once the muscular and respiratory capacity; but when the latter quality is of primary importance (as in rowing), a second measurement should be taken lower down the chest, the tape being passed over the ninth rib. A third measurement, to test the elasticity and mobility of the chest, as shown by the extent of its expansion on the fullest inspiration beyond the point of the preceding measurements, may be taken on either of the above lines. To take these measurements with perfect accuracy is always difficult, as the mere act of attention and state of consciousness or expectation of the person being measured will affect the breathing and therefore the actual girth of chest at the time. For this reason it is always desirable whenever it can be done, or when any doubt as to the accuracy of the measurements exists, to draw the attention by question or remark to some other subject than that of the work on hand.

Forearm. (*All measurements of the upper and lower limbs to be skin measurements.*) The arm extended as in the preceding measurement, but with the hand tightly closed. The tape to be passed around the thickest part of the arm, and its girth at that point reckoned.

N.B.—With men who have taken little exercise this line will always be found near the elbow joint, but as the limb becomes developed, and the numerous muscles of the forearm acquire bulk and power from exercise, the greatest girth will be found from 2 to 3 inches below it: unless this circumstance be kept in view the actual increase will not be perceived.

Upper arm. The hand closed as in preceding measurement, but with the arm bent at the elbow, and the hand brought down towards the shoulder; this should be slowly and gradually done, bending the joints of the fingers, clenching the fist, and bringing the forearm down upon the upper arm. The tape to be passed in a straight line around the thickest part of the arm; this will always be found over the ridge of the very prominent muscle on the upper surface (the biceps). It is by the contractions of this muscle chiefly that the arm is bent in the position of the measurement, and, with its antagonistic muscle on the obverse side of the arm (the triceps), by which it is again extended, forms the bulk of the upper arm. The tape measurement, therefore, at this point, *caeteris paribus*, is an accurate gauge of its power.

N.B.—When the whole arm is fully developed, the difference in size between the fore and upper arm in an adult of medium stature will be about 2 inches, and it will almost invariably be found that when the upper arm is feeble, the upper region of the chest will be feeble also. With a chest of 40 inches the arm would probably be 12 inches and 14 inches.

Certain measurements of the lower limbs should also be taken and recorded when it is desired to ascertain their present condition or rate of development; the measurements which will show these most accurately, and at the same time most directly correspond with those of the upper limbs, are the following:—

Calf. The limb to be held stiff and straight, the heel raised from the ground, the toes pressed strongly down and the knee braced back. The tape to be passed around the thickest part of the calf, and as the position of this line will somewhat vary with different men, and with the same limb in different stages of development, one or two points should be tried, and that which shows the greatest girth selected.

Thigh. The limb placed as in preceding measurement. The tape to be passed in a horizontal line around the thickest part of the limb, which will be at the highest point of the thigh admitting of horizontal measurement.

APPENDIX I.

GYMNASTIC SCHOOLS,

THEIR CONSTRUCTION AND REQUIREMENTS.

WITH the first conception of the leading features of this system, I perceived that the construction and fitting up of proper gymnasia would be a *sine qua non*, indeed must be viewed as an integral part of the system itself.

In the cultivation of the bodily powers it is quite necessary that the instruction should be progressive—that to-day's lesson should, as it were, be taken up to-morrow and carried a little farther, and the next day and the next a little farther still, and so on to the end of the course. When thus administered, each lesson is in accord with that which preceded it, and with that which is to follow it—each aiding each—each improving that which has gone before—each preparing the way for that which is to come; but this, of course, can only be done where provision is made for regular and consecutive instruction. Now, regularity and consecutiveness, it will at once be seen, are quite incompatible with open-air practice in any country whatever; and in a climate like ours are simply impossible. There are few days in the year that are really fit or suitable for such practice, or on which men would willingly encounter its discomforts; and a system of bodily training which is dependen upon the favour of the weather is in reality no system at all.

I have alluded to the discomforts of open-air practice; these may seem trifling, but when examined are more serious than appears at first sight. To execute any gymnastic exercise, or any exercise indeed of any kind in which strength is to be exerted, or is to be derived from its performance, there must be complete freedom of clothing. This simply means that a man must be stripped to his shirt and trowsers, with his neck open, his head bare, and his sleeves tucked up to his elbows. Now, it is of the essence of gymnastic exercises, after the rudimentary lessons, that the efforts shall for the most part be brief and energetic, with some necessary standing about, waiting for and watching the efforts of others. And this, with men so employed, and so exposed, and so constituted, is, save on rare occasions, neither sanitary nor even safe in the open air.

I need scarcely, I am sure, state, that I of all men am least disposed to enervate or *coddle*; the whole work of my life has been, and is, and probably will be, to make men not only healthier but hardier; to teach them how to retain the strength they have, as well as how to add to its amount. But if experience has taught me anything, it has taught me this; that more evil may be done by rash and sudden exposure—by what is generally known as the *hardening* system, than by all the coddling in the world. It is not by exposure that men are either strengthened or rendered hardy; they must be strong and hardy before they are fit to be exposed; they must be seasoned first, and exposed afterwards. If we cannot season a piece of timber by sudden, or extreme, or unregulated exposure, we must not think we can do so with a living man, or a living anything.

Another important reason why proper gymnasia are essential is, that they may be fitted up with apparatus of a character and description which could not be attempted out of doors. In elaborating this system of bodily training, I have found it necessary to invent many new machines to yield the special form of exercise which I desired in order to produce certain results in the learner; and almost all *those which are called* of an educational character, and have *for exclusive object* to cultivate the resources of the body, require the roof and walls for support, and the soft floor of the building for safety; and those of an entirely opposite description can be erected, and the exercises practised on them, with much greater facility here than in the open air; for every portion of the interior face of the walls, and every part of the internal roof, may be utilized, turned to immediate account, and made to serve as bona fide apparatus.

I say nothing of the facilities which a building presents over the open ground for giving and receiving instruction, and of preserving order and propriety among the learners, without having recourse to too strict a discipline. For it is quite essential to safety, as well as to advancement, that the strictest order and propriety should be preserved in the gymnasium; and there is no fact more undoubted than this, that amongst gymnastic apparatus, the disposition of the learner to be inattentive and careless, and the difficulty of the instructor in communicating instruction and maintaining order, is uniformly beyond comparison greater in the open air than in the gymnastic school. Neither do I notice the safety arising from the assured condition of the apparatus in the gymnasium, exposed as it is to no atmospheric influence, always dry and always clean. Indeed, while the out-of-door apparatus must necessarily be getting worse and worse, the indoor apparatus, if properly constructed, and its materials suitably selected, should be virtually indestructible.

I have thus noted a few, and only a few, of the advantages which the gymnasium possesses over the gymnastic ground, but each one of these is most important in itself, and is pregnant with many others. I would now inquire, are there any advantages on the opposite side, any advantages which the ground has over the building? And, if so, are they of such importance as in any way to counterbalance those which I have just enumerated in favour of the building? These are questions which I have fully considered, and I am prepared to answer, 'None—not one;' the open-air practice not one real advantage; it has not even any apparent one which may not be shown to have a reverse influence and bearing.

Its apparent advantages are—first, ample space; second, abundance of light; third, pure air. With the phrase 'out of doors' and 'open air,' we are led to associate ample space, but this signification is often quite illusory when applied to the present subject; for it is found that the very places where gymnastic exercises are most wanted, where they would prove the greatest boon, are precisely those where ground is scarcely attainable at any price or for any purpose, namely, in towns and in barracks situated in closely-populated districts. In such cases the advantage, of course, is all in favour of the building—in favour of the method which knows how to economize every square foot of ground, and to make it serviceable all day and every day, morning, noon, and night, wet or dry.

A small nook in a playground or in a barrack-yard, 80 ft. by 40 ft., will be sufficient for a gymnasium, which will give abundant accommodation throughout the year to the largest school or college, or to a garrison of a thousand men. They require no more ground than the apparatus covers; and they could use no more were it planted in the middle of the widest common in England.

The question of light, when examined, is solved at once; and I have no hesitation in saying that it is in favour of the building; abundant light for any purpose can be admitted into any building, and in the gymnasium it can be so admitted and so distributed as to meet precisely the special wants of the special exercises.

The question of pure air is less easily disposed of, for there is nothing more essential to health and to health-giving exercise than pure air; while there is, on the other hand, nothing more liable to deterioration, for every breath we breathe acts injuriously upon it—subtracts from it some *portion of the good* which it possesses, and imparts to it *that which is* pernicious; and it must be admitted that this process of deterioration is only sustained where the air is confined around the breather in a building, and is entirely avoided when he stands in the great air ocean out of doors.

Moreover, it must never be forgotten that a gymnasium is a veritable temple to health in the highest sense of the word; and pure air, which is desirable everywhere, is imperatively necessary here, absolutely essential during exercise, not only for the perfect aëration of the blood, but as the natural stimulant to physical exertion.

And again, just in the same ratio with the requirement for the purity of the air in a gymnasium, is its liability to deterioration; first, by the doubly-increased respiration of the inmates—each breath being larger in volume, and each following each in quicker succession during exercise than when the body is wholly or comparatively at rest; and secondly, in a great degree also, by the exudations from the skin, which is stimulated to its utmost activity by the powerful and sustained muscular exertion; and it must be remembered also, that while these exudations are increased to their utmost extent by the energy and freedom of the partly denuded body, its escape into the surrounding atmosphere is also by the same means facilitated. Now while these are all incalculable advantages to the individual, and the very source and secret of the health and strength which he derives from exercise, they all tend directly and powerfully to deteriorate the air.

Another point still; admitting that the gymnasium is occupied to the estimated extent of its working capacity, at the end of an hour (the usual time allotted to an ordinary lesson) the air in the building, were there not an unceasing interchange taking place between it and the external air, would be so deteriorated as to be rendered less suitable to the use, and less pleasant to the sense, of the next class of learners.

Here, then, we encounter these important facts, not only pure air is essential to health, and to the pleasurable sustentation of active bodily exertion, but that this exertion itself is a powerful agent in its deterioration, and that this deterioration is only felt where the same air has to be inspired and re-inspired, as in a building.

Now as this necessarily applies to all buildings, though not to all in an equal degree, we may be sure there is a way in which this evil can be avoided, for He who planned our existence did so with the full comprehension of our wants—saw that while we were so constituted as to require the shelter and protection of dwellings in which to live and learn and toil, that these very buildings expose to deterioration the substance on which we depend for momentary existence. The difficulty that seemed insurmountable is at once overcome by the action of the law regulating the constitution of the air itself. On the slightest change in the constituents of the air, such as that caused by respiration, or by the elevation of its temperature, it is impelled to instant motion; forced to shift and change its place, that place being immediately occupied by the surrounding air; so that motion and change of position is induced, proportionate in force and in extent to the primary displacement. This law is in unceasing and unerring operation over the whole surface of the globe, regulating equally the mighty currents caused by the sun's heat in the belt of the tropics, and the slight undulations in an ordinary room caused by the breath of a solitary inmate. This law is the key to all our rational systems of ventilation. It teaches us to construct our dwellings in such a manner that the air, which is in unceasing motion—a mighty current ever flowing, though changing its direction with proverbial inconstancy—may pass through them in its course, cleansing them of every impurity. It teaches us so to regulate the admission of this current, that at any time, and at any season, it shall be in accordance with the wants and the wishes of the inmates.

The special mode of ventilation for a gymnasium I conceive *to be—the building* must be so constructed that the whole body of air within it may in a few minutes be changed for an equal body of fresh air, for this will be required at frequent intervals. It must be so constructed that the deteriorated air may ascend and pass at once out of the building, and a fresh supply at the same time enter; and these apertures for ingress and egress must be so placed, that the fresh air may be admitted at such distance from the inmates that it shall not strike them in compact cold currents, or draughts as they are called, but be uniformly diffused; for this must be maintained throughout the working day. It must be so constructed, in fine, that it may be as snug an ordinary room in winter, and as free and airy as the open heath in summer. And this should be done by what may be called natural means.

This much for the purity of the air; but air has other qualities besides purity, for we live in it as well as breathe it; it comes in contact with our skin as well as with our lungs; temperature, therefore, is very important. The air may be quite pure when the thermometer stands at 20 degrees below freezing-point, as we sometimes experience, or rises to 80 in the shade, but neither of these conditions are favourable to exercise, and least of all to gymnastic exercise.

Now in a properly-constructed gymnasium, the temperature of the air may be rendered pleasantly cool in summer, and sufficiently warm in winter, to let men freely strip for active exercise. We do not want a heated or rarefied air to breathe during active exercise; men have the materials of heat within themselves, and want but exercise to ignite the fuel and sustain the fire; but we do want the temperature of the air so raised as to remove actual discomfort in stripping to work, and to dry and keep dry the apparatus which must come in constant contact with the naked hand, and this can only be done in the properly-organized gymnasium[1].

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[1] For this purpose there is nothing so good as the open fire grate buted in suitable places in the different divisions of the building.

I will now notice a few of the principles which guided me in preparing a design for a building suitable to the system.

The first of these was, that the form and manner of construction of the gymnasium should be such as to admit of the erection of the desired system of apparatus, and to present the greatest facilities for instruction and supervision. The second, that it should be constructed to meet, in the best manner, the sanitary requirements which I have just noticed. The third, that in all important respects, the same design should be capable of reduction or extension, so that its working capacity might be in proportion to local requirements. In this last respect it was not necessary to compute the absolute working space required for every class of learners, but to ascertain the smallest dimensions of a building which would contain with adequate freedom a fair selection of the essential apparatus in the different sections of the system, and from this minimum size to ascend by carefully regulated gradations to a maximum size.

The whole exercises of the system resolve themselves into two distinct kinds; first, those with moveable apparatus, used for the introductory course, in which the learner lifts or wields the article of apparatus, he himself standing firm; and secondly, those on the fixed apparatus, comprising the bulk of the system, where the learner himself moves or turns, the apparatus or machine being fixed or firm.

This distinction is very important, not only as effecting the character of the exercise to be performed, but the whole material means used in performing it, and even necessitates a distinct division of the building itself into two parts, each part being in certain respects, in appearance and in fact, the very antithesis of the other. In the first division, that for the moveable apparatus, the floor is retained perfectly free and firm, the apparatus, when not in use, being *ranged in racks* along the walls. In the second division, the *floor is made of* soft elastic materials, with every spot of its surface mapped out and studded with apparatus permanently fixed.

I have already stated that, in elaborating this system of bodily training, I have found it necessary to invent many new machines to yield the special form of exercise which I desired, in order to produce certain results in the learner; for instance, I have found that few men are equally developed on both sides of the body, as a natural result of the greater employment given to the right side during the period of growth; and this applies not only to the arm, but to the whole side, from shoulder to hip, and not infrequently including also the lower limb, when the development of the right leg and foot preponderates over the left. Now I consider it of the greatest importance to health that this lost balance of power should be restored, this equilibrium of development re-adjusted; and to accomplish this I have found it necessary to invent a number of machines for the sake of the form of exercise which I desired to be performed on them. Among the first of these I would mention the Elastic Ladder and Row of Rings—machines designed expressly to give employment to both sides of the body equally, and especially to the chest and upper limbs, by necessitating that both sides of the body shall perform the same work, requiring the exertion of the same degree of effort, and that neither side shall be able to aid the other; each side must do its own share only; and therefore if the weaker side be doing as much as the stronger, it will virtually be doing more (being weaker), and the amount of difference in exertion will be of course in relation to the amount of difference in development or power. And therefore the unerring result of the natural law of development being, *cacteris paribus*, in relation to activity, the weaker side will ultimately recover its lost position and its fitness for fair companionship with its fellow.

I have mentioned the nature and object of these two hines for the twofold purpose, first, of showing that it was what I had discovered to be the actual wants of learners or pupils which guided me in preparing my exercises and in inventing apparatus which would yield the form of exercise desired; and second, of showing that it was the form of that apparatus and the nature of the exercises to be performed on them which determined the form and construction of the building itself.

For instance, an important section of apparatus is that which teaches men to clear objects by running, vaulting, and leaping; therefore for these considerable length is required. A second section of an elementary character, as the Horizontal Bar, Parallel Bars, and the two machines which I have just described, machines all capable of being worked by large numbers of men at the same time, also requires length; therefore the oblong shape, which admits of the apparatus of these important sections being arranged side by side, has been chosen for the gymnasium. A third section, consisting of all climbing apparatus, whether mast, rope, or pole, requires height; but as these are all vertically placed, they may be closely grouped, so that a small portion only of the building needs to be very lofty. These three sections of the apparatus in a very clear manner determine the most suitable and serviceable form of building, namely, an oblong, of a breadth about half the required length, and with one portion of it lofty. The position of this lofty portion naturally falls to the centre; for the end walls are also utilized, the one bearing every form of vertical apparatus, the other every form of slanting apparatus. The elevated portion farther serves in lighting and ventilating the gymnasium in the place where light is most wanted, and is where ventilation, of one kind, may be most effectively obtained.

The same oblong form I found also to be the most suitable for the other division of the building; for the distribution of classes in the introductory course of gymnastics, and for *classes of fencing* and sword exercise. And as it was desirable *for purposes* of supervision and instruction that both divisions should form one building, and that every portion of it should be overlooked from every other portion, these two divisions are generally placed rectangular to each other.

I have only now to notice the galleries for spectators. It is most desirable to encourage visitors to the gymnasium; it is remarkable, sometimes, how the presence of visitors serves to stimulate the learners to energetic action, and at the same time to assist in preserving the proper decorum of the lesson; but it is equally desirable that they should not mix among, or in any way interfere with, the learners. The galleries for spectators in both divisions are so arranged that they overlook the whole gymnasium without encroaching upon the working space.

THE END.

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